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MARCH 1989
VOLUME 7, NUMBER 11

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13. SILENCER	30	19
14. BLACK PATCH (MASTER)	50	25
15. BLACK PATCH DATA DISKS 1 & 2	20	10

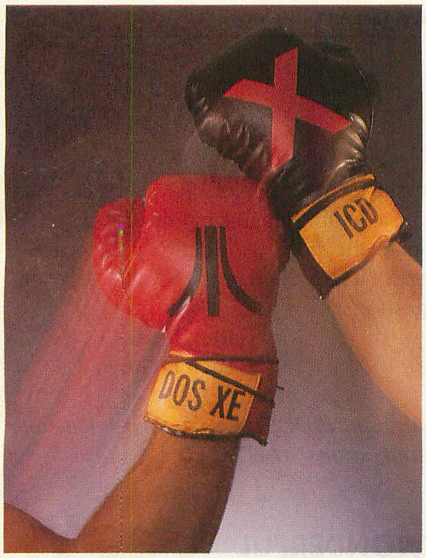
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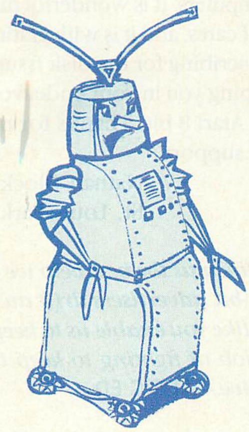
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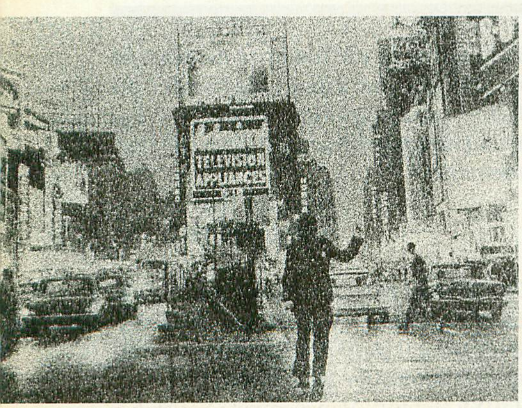


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NEWSROOM XETEC FIX

I own an Atari 130XE, a Panasonic 1080i printer and a Xetec Graphix interface. This setup worked fine, until I got Newsroom from Springboard Software. For some reason, I got a lot of strange characters on my page when I tried to create a newsletter. Springboard's customer support was unable to help me, but with the help of a friend and a lot of experimentation a fix was found.

Set the Newsroom printer driver to Epson MX-70 and set the Xetec DIP switch to the ON position. The program will run faultlessly. Just don't forget to reset the DIP switch when you're done!

Robert Shutts
Joliet, IL

TALKING TODDLE AUTOLOAD

My kids just love *Talking Toddle Type* (October 1988 disk bonus). To speed up the fun, those with a 130XE and SpartaDOS 3.2 can AUTOLOAD the .SPK speech files with a STARTUP.BAT file. Put TODDLE.EXE, all the .SPK files, and the SpartaDOS system file RD.COM on a SpartaDOS formatted disk with X32D.DOS on it. Create a file named STARTUP.BAT on the same disk containing the following commands:

```
BASIC OFF
KEY OFF
RD D3:
COPY D1:*.SPK D3:
TODDLE.EXE
```

This batch file turns off internal BASIC so you don't have to hold down [OPTION]. The keyboard buffer is also turned off, since kids usually press the keys longer than adults. An internal RAMDISK named D3: is created to store the .SPK files which are subseqently loaded into memory. Finally, the assembly language program is loaded and executed.

When the initial Toddle Type selection menu appears, [SELECT] the Speech Drive and [3]. Press [START] and away your kids go. My next project is to figure how to make Drive 3 the default Speech Drive in the assembly language program and eliminate the need to [SELECT] the correct Speech Drive and press [START]. Any suggestions?

Rick Reaser
Pacific Grove, CA

Any SpartaDOS users out there have some suggestions?—ANTIC ED

WONDERFUL

I think it is wonderful that you have decided to give more space to the Atari 8-bit computers. It is wonderful that somebody still cares, and it is with gratitude that I am subscribing for the disk issue. I hope I am helping you in your endeavor to support the Atari 8-bit. Thanks for the many years of support.

Nathan Block
St. Louis Park, MN

You've given us the best help we can ask for. As 8-bit advertisers drift away, subscribers like you enable us to keep on doing the job of fighting to keep the 8-bit Atari alive.—ANTIC ED

EXTRA 130XE MEMORY

I am trying to use the extra memory on my 130XE to run a long program, and my lack of success has me confused. How can I load my program and data into the extra memory?

Norman Hall
Allentown, PA

Two articles from Antic back issues might be of assistance. 130XE: How Atari's New 8-bit Does It *(July 1985) lists some of the specifications for the extended RAM. In* 130XE Memory Management *(November 1985), Ian Chadwick, author of the invaluable resource "Mapping the Atari" (COMPUTE! Publications) tells how to use that extra 64K, and includes a type-in BASIC tutorial program.*—ANTIC ED

POLYHEDRON PRINTOUTS

I wrote you to see if there was a screen dump program that would produce a reverse printout (black on a white background) of screens generated by *Polyhedron Designer* (October 1988). A few days later I remembered your December 1987 Disk Bonus, *Antic Publisher.* I ran Antic Publisher, loaded a PICTURE.PIC file from Polyhedron Designer, and obtained a black-on-white image I could edit with the Graphic Editor. Another case where a writer answered his own question!

Theodore Winkel
Madison, IN

POLYHEDRON PROBLEMS

I just finished booting the October 1988 Antic monthly disk. *Talking Toddle Type* is great and *The Seven Skulls* was a challenge. Having worked as a Russian linguist for a number of years, I really enjoyed the *Quizzer* program. Imagine my dismay when *Polyhedron Designer* didn't work. It split the design and put it all over the screen. What happened?

Keith Hansen
Warrensburg, MO

It's impossible to tell what went wrong just from your letter. The most likely problem is that the parameters were entered incorrectly and resulted in an object too big to show on screen. Try using the parameters shown in the screen shot on page 29—the results should be the same as in the picture.—ANTIC ED

PAPERCLIP TRANSPLANTS

Dr. Brilliant stated in his article on memory upgrades (November 1988) that the only use for expanded memory on a 130XE would be a large RAMdisk. Right at this moment I am using the 130XE version of PaperClip on a 130XE beefed up to 320K. (I have the upgrade by Scott Peterson.) With my expanded memory I have 128K of space in which to type my document. I would say this qualifies as a commercial program that uses the extra RAM.

Brent Fisher
Jackson, MI

Since PaperClip is not currently available commercially, this doesn't completely disprove Dr. Brilliant's assertion. Still, there may be other programs that utilize the extra RAM. We'd be glad to hear from readers who use any such programs.—ANTIC ED

UP TO ATARI

I was pleased to read in your October 1988 Editorial that you will be increasing the amount of space dedicated to the 8-bit. I would also like to see more software offered in The Catalog. At the end of the editorial you said, "What happens is largely up to you—the Atari 8-bit user." I would like to take issue with that statement—I believe that is is up to Atari Corp. to get off their duff and support us 8-bit users. If Atari would advertise and come out with an inexpensive hard drive, maybe they could compete.

Ross Himes
Chesterton, IN

As announced in the January 1989 **Antic**, *we're working on getting more 8-bit products into The Catalog. For us, a lot does depend on you users. We're in business, and if 8-bit products don't sell, we can't keep offering them. So encourage your friends and local dealers to buy Antic 8-bit Software!*—ANTIC ED

NOISY 1050

I've read many complaints of noisy Atari 1050 disk drives. To fix the problem, take off the cover and put a very light drop of fine machine oil (sewing machine oil is excellent) on the metal runners on which the head moves back and forth. Voila! A quiet 1050! I've been doing this for three years now and have never had a problem. Just remember to use a *very* small amount, so oil does not get on the head itself.

Michael Seaman
Willowdale, Ontario
Canada

As always, please keep in mind that opening the drive voids any warranty you might have left. Antic takes no responsibility for results of home repairs or hardware modifications.—ANTIC ED

DESPERATELY SEEKING RECORDER

I am writing to you after many attempts to locate an Atari 1010 Cassette Recorder. It seems the 1010 Recorder is out of production. Is there any way I can hook up my audio cassette to my Atari 800XL so I can retrieve data and programs stored on cassette?

John Holland
Columbia, SC

Unfortunately, you can't use an audio cassette with your 800XL. Your best bet is probably to get in touch with a local users group, where someone probably can get you access to a 1010. One group in your area is: GRACE (Greenville Regional Atari Computer Enthusiasts), 18 Bedford Lane, Taylors SC 29687.—ANTIC ED

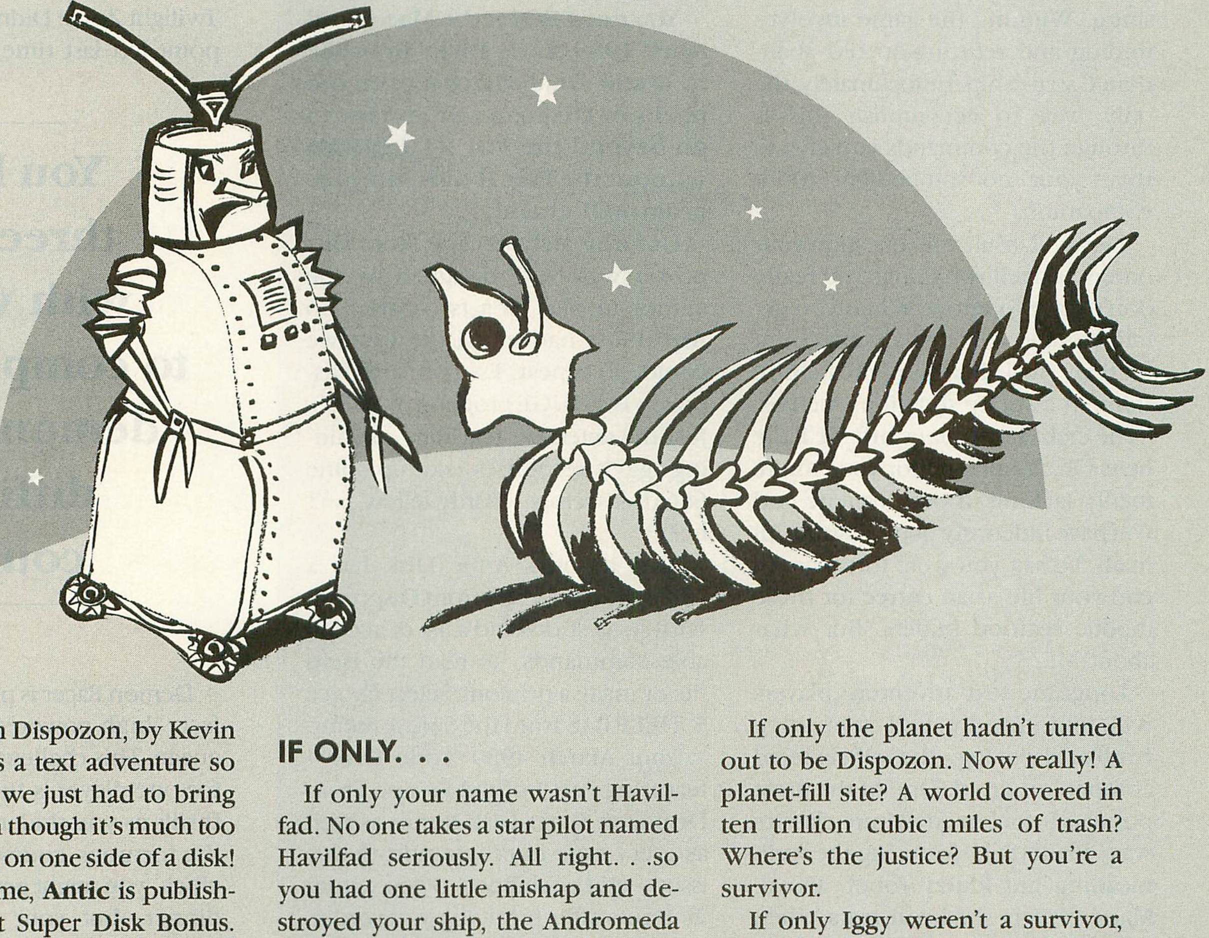
***Antic** welcomes your feedback, but we regret that the large volume of mail makes it impossible for the Editors to reply to everyone. Although we do respond to as much reader correspondence as time permits, our highest priority must be to publish I/O answers to questions that are meaningful to a substantial number of readers.*

Send letters to: Antic I/O Board, 544 Second Street, San Francisco, CA 94107.

Escape From Dispozon

Antic's biggest text adventure ever.

Program by Kevin Sherratt


Kate Murphy

Escape from Dispozon, by Kevin Sherratt, is a text adventure so good that we just had to bring it to you—even though it's much too long to even fit on one side of a disk! For the first time, **Antic** is publishing a two-part Super Disk Bonus. Part I takes up the *entire* Side B of this month's disk. The conclusion, Part II, will take up the entire Side B of the April 1988 Antic Disk next month. (No April fooling, folks!)

Here's a sample of what the dangerous but quirky planet of Dispozon is like:

IF ONLY. . .

If only your name wasn't Havilfad. No one takes a star pilot named Havilfad seriously. All right. . .so you had one little mishap and destroyed your ship, the Andromeda Doria. Mistakes happen! There was a planet nearby anyway, and you managed to get into the lifepod.

If only the lifepod hadn't ejected you and melted in entry. Well, even so, it's not as though you're the first space pilot to be marooned on an unknown planet.

If only the planet hadn't turned out to be Dispozon. Now really! A planet-fill site? A world covered in ten trillion cubic miles of trash? Where's the justice? But you're a survivor.

If only Iggy weren't a survivor, too. Oh, you've got nothing against companion droids. In situations like this, companion droids are a pilot's eyes and hands. They're helpful and friendly, unassuming, selfless and obedient, following every command to the letter.

If only Iggy was like that. . .

You've heard of landfill sites? Well, Dispozon is a planetfill, a world-sized garbage dump—and you've had the bad taste to crash there. You and Iggy, your companion droid, are stranded on an island of rubbish in a sea of sewage. This isn't a healthy environment for man or robot. The dangers of Dispozon are many and varied, from kittens and crabs to a crazed old coot.

You, Havilfad, must find a way to escape the slimy, greasy, junk-filled shores of Dispozon—before you are fatally poisoned by the toxic smog. Winning the game involves finding and refitting an old abandoned spaceship. Unfortunately, the only way to accomplish this is through the commands you give to Iggy, your not-so-obedient robot companion.

Iggy will insult you, question your orders and tell you things you really don't want to know. When you get into trouble, you can always count on Iggy. He'll always say the helpful thing in a sticky situation, such as, "The crabs have cut us off! We'll die here. Oh, it's all right for you. You're totally lacking in oral hygiene and you have hideously poor posture. All in all, I'd say you were fortunate to end your life as an entree for these mobile seafood buffets. But what about ME?"

Longtime text adventure players will undoubtedly find something familiar about Iggy, the self-centered companion droid. One of the most popular Infocom adventure classics was "Planetfall," featuring the well-meaning but klutzy robot, Floyd. Many players shed real tears when Floyd apparently sacrificed his life to save the day. And many reviewers hailed Floyd as the first truly well-rounded character in interactive fiction. Escape From Dispozon recalls much of the memorable atmosphere of "Planetfall" — except that you're marooned on a "planetfill" now and your companion isn't Floyd, but irascible Iggy the Droid.

IMPORTANT: Due to some tinkering by the **Antic** technical staff (actually duplicating a few key data files from Part II onto the March 1989 disk) you not only will be able to experience the randomized introduction to the adventure—you can also solve the first few challenges of Escape From Dispozon using this month's disk alone. Admittedly this just gives you a taste of the complete game, but it's worth waiting for Part II.

You need BOTH the March and April 1989 Antic Disks in order to attain final victory over the perils of Dispozon. If you try to go beyond the FOURTH ROOM without the Part II disk, the program will crash!

Unfortunately, Escape From Dispozon was NOT designed by the author to play as a two-parter, so **Antic** just had to do the best we could. To repeat, Escape from Dispozon is a HUGE program in BASIC. Just the extensive text files containing Iggy's responses take up some 686 disk sectors. (Wordy fellow, isn't he?).

This month's Antic Disk has a HELP file for Escape from Dispozon, with suggestions and a list of acceptable commands. To read the Help file or make a printout, select choice 5, HELP.BAS from the Side A menu.

Your March 1989 Antic Disk—featuring Part I of the Escape From Dispozon Super Disk Bonus as well as every type-in program from this issue—will be shipped to you within 24 hours after receiving your order. Just phone Toll-Free to the Antic Disk Desk at **(800) 234-7001**. The monthly disk is only $5.95 (plus $2 for shipping and handling) on your Visa or MasterCard. Or mail a $5.95 check (plus $2 shipping and handling) to Antic Disk Desk, 544 Second Street, San Francisco, CA 94107.

The daily commute has finally gotten out of hand. You endured some messed-up streets before this, but today is the worst you've ever seen it. In desperation, you try taking that backroads route home, the one through the delta that oldtimers still tell stories about. And boy, are you sorry! Drawbridges, detours and truly impossible turns have made the drive home a nightmare, and you're not sure you didn't drive right into the Twilight Zone! Didn't that detour sign point left last time you went by?

You have three cars with which to complete this demoniacally difficult course.

Demon Racer is programmed in the fast, high-powered ACTION! language. This challenging driving game for one player is full of fast-scrolling thrills as you skid and crash through the tortuous course. If you beat the clock, you might get home in time for dinner—but your first objective is simple survival.

GETTING STARTED

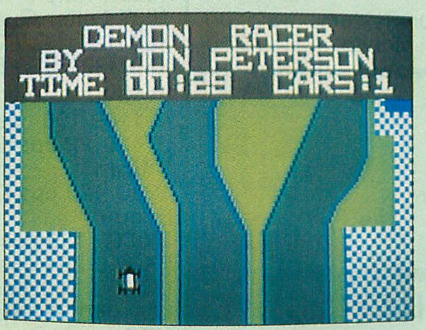
Type in Listing 1, RACER.ACT, and Listing 2, SCREEN.ACT, and save a copy of each to disk before you start the game.

Antic Disk users don't need the ACTION! language cartridge to use

Demon Racer

Desperate ACTION!

commute through the Twilight Zone. **By Jon Peterson**



Demon Racer is a fast-scrolling ACTION! game for one player that forces you to steer your car through roads filled with all sorts of devious obstacles. The program works on 8-bit Atari computers with at least 32K memory, disk drive. You also need the ACTION! programming language—unless you use the special runtime version of Demon Racer on this month's Antic Disk.

Demon Racer. A runtime version, RACER.EXE, is on this month's disk. (Runtime ACTION! translations are nearly always too long for printing as type-in listings.) Copy RACER.EXE to another disk that has been formatted with DOS 2 or DOS 2.5, and make sure the disk contains a DOS.SYS file. Rename RACER.EXE to AUTORUN.SYS. To start racing, turn your Atari off, insert your RACER.EXE disk, remove all cartridges (XL and XE owners press [OPTION]) and turn on your computer. Demon Racer will load and run automatically.

After the title screen is displayed, press [START] or your joystick button to begin. You have three cars with which to complete this demoniacally difficult course.

Move the joystick left and right to steer your racer. Move the joystick forward to speed up. To slow down, move the joystick back or press the button. You can also press the spacebar to pause the game. Pressing any other key will resume play.

If, against all odds, you complete the course, the demons will become angry and cause a thunderstorm with lightning to appear. If you wish to play again, press the [START] key.

OBSTACLES:

The following obstacles must be avoided to complete the course:

Drawbridges open and close periodically. If you try to pass through an open drawbridge, you'll crash.

Land mines will appear periodically and must be avoided or you'll crash.

Gates and **Barricades** open and close, while **detours** force you to maneuver around them. Also, detours move, so you must time your passage carefully.

If you happen to crash at some point (more than likely), you will be sent back to the beginning of your current lap, with a new car and a three-second penalty. Remember, you only have three cars, and you'll probably need them all. Good luck, Commuter.

Jon Peterson lives in Concord, California. This is his first appearance in **Antic**.

Listing on page 22

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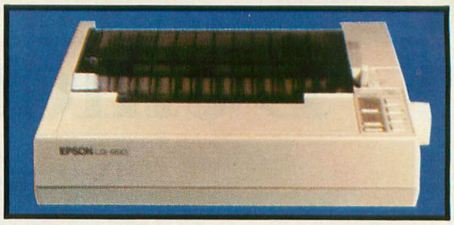
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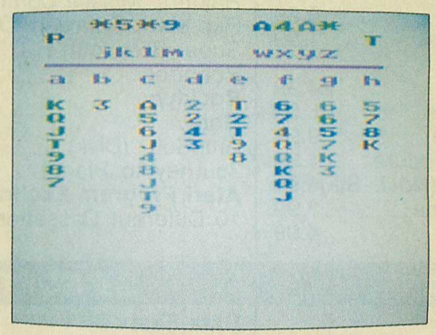
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B603

Baker Solitaire

All the cards are face up, so there's no excuse. **By Tom Cline**



Baker Solitaire is a computer version of Eight Off, an "open" solo card game. This BASIC program works on 8-bit Atari computers with at least 48K memory, disk or cassette.

Almost everyone has played Klondike, perhaps the most popular of solitaire card games. In Klondike the cards are dealt face down (except for the top card) into seven columns with one card in the first column, two in the second column and so on.

Klondike is an example of a closed solitaire game. A closed game is one in which a decision on the play of a card is made without full knowledge of all the other cards.

Baker is an "open" solitaire game, a version of Eight Off, in which all cards are dealt face up. Since a player has complete information on all the cards, each position of the cards can be analyzed to determine the "best" next move. (Baker appeared in Martin Gardner's column in the June 1968 issue of Scientific American. The game is named after C.L. Baker, who introduced the game to Gardner.)

GETTING STARTED

Type in Listing 1, BAKER.BAS, check it with TYPO II, and SAVE a copy to disk before you RUN it.

If you have trouble typing the special characters in lines 45-50, don't type them in. Instead, type Listing 2, check it with TYPO II and SAVE a copy. When you RUN Listing 2, it creates these hard-to-type lines and stores them in a file called LINES.LST.

To merge the two programs, disk users LOAD "D:BAKER.BAS" and then ENTER "D:LINES.LST." Cassette users: CLOAD Listing 1, then insert the separate cassette used for Listing 2 and ENTER "C:". Remember to SAVE the completed program before you RUN it.

Baker can be played with two, three, or four suits of thirteen cards each. The degree of difficulty increases dramatically with the number of suits.

Each suit is represented by a different color. The card values are indicated by single-digit numbers and letters. A ten is indicated by a capital T.

The cards are dealt face up into columns and rows called the "field." The number of columns of cards in the field depends on the number of suits used. Two suits yield six columns, three suits produce seven columns and all four suits give you eight columns.

The object of the game is to sort all the cards of each suit into a separate pile, called a "terminal pile." The cards must be placed one at a time on this pile, in ascending order, with the Ace

on the bottom and the King on top.

Each terminal pile starts on one of the green stars at the upper right of the screen, in an area marked with a "T."

You can use the space bar to "take back" moves—even back to the beginning, if you like.

In addition to the field and the terminal pile, a card may occupy a "parking space" at the upper left of the screen, in an area marked with a "P." There are as many parking spaces as suits. Each space is marked by a gold star with a letter underneath, and can hold only one card.

RULES OF PLAY

Within the field, an exposed card (a card at the bottom of a column) can be moved onto the next-highest card of the same suit, if it is also exposed.

For example, if a green six is exposed in the first column, and a green seven is exposed in the second column, the six may be placed on the seven.

A card in a parking space may be moved onto the field the same way.

Any exposed card can be moved to an empty parking space. Each parking space will hold only one card at a time.

Any exposed card, or parked card, can be moved onto the terminal pile, so long as it follows the sequence. Once a column is empty, any exposed or parked card can be moved to it.

MOVING CARDS

A card is moved using the keyboard. First, press a letter indicating the column or parking space of the card to be moved. Next, press the letter indicating the card's destination. To move a card from column 'b' to parking space 'k', for example, you'd type **BK**.

The first letter pressed will turn black to show you which card is being moved. When the second letter is pressed, the card is moved, you'll hear a tone, and the first letter's color will change back to purple.

If an illegal move is attempted, either one of the letters or the purple line will flash on and off for a few seconds. If you decide not to move a card, just press the key that corresponds to the black letter.

TAKE IT BACK!

At any point you can use the space bar to "take back" a move and restore the previous positions of the cards. The program can remember up to 300 moves—enough to go all the way back to the beginning of most games. You may want to use this feature to try a different line of play if you get stuck, or to study possible moves.

Use the letter P to mark a position that you may want to return to. When you go back to that position using the spacebar, a buzzer will sound and the letter P will turn blue. These options can be very useful in studying play strategy.

GROUP MOVEMENTS

While only one card can be moved at a time, there are certain positions of the cards where it would be convenient to move a group of cards. For example, if you're lucky enough to have a green 8, 7, 6 and 5 in the bottom of column b, and a green 9 at the end of column c, *and* enough open columns or parking spaces to move them all one at a time, you'd type **TBC** to move the 8, 7, 6 and 5 from column b to column c, all at once.

If the group transfer cannot legally be made, one of the column letters will blink on and off several times. To stop this command without completing a group move, press T again.

You can save quite a few keystokes by using the letter T when you want to move a group of cards. If you're just learning the game, however, you should move just one card at time until you become more familiar with the game.

To start a new game press the ESC key. Once you've won a game, BAKER will flash the word "WINNER" and tell you how many moves it took you to complete the game. Press any key to play again.

Tom Cline of Berkeley, California is making his debut in **Antic**.

Listing on page 27

RANDOM ATARI

Enhancing the number generator.

BY DAVID McINTOSH

Random Atari is a teaching article and utility program that explains a little-known technique of generating a repeatable series of "pseudo-random" numbers that make it easier for you to debug your programs. The technique also produces a much wider range of random numbers. This BASIC program works on all 8-bit Atari computers of any memory size, with disk or cassette.

The Atari 8-bit computer has an excellent random number generator. In fact, its biggest drawback is that the numbers it produces are too random!

Random numbers are generated on the Atari by measuring random noise on an electronic circuit, and converting this to a value between zero and 65,535. This is divided by 65,536, to give a value between zero and one. These are excellent random numbers, but they are non-repeatable. If you run a program whose results depend on random numbers, you will never be able to repeat those same results.

Being able to repeat results can be very important. For example, tracking down an intermittent bug in a non-repeatable program can be a real nightmare.

If only the error could be produced consistently, it would be much easier to find and correct. Or maybe you want to test various scenarios on your program, but can't be sure the test results were successful because you never get the same results twice. Or you have written a game with a beginner mode, and want the same obstacles repeated every time, while the advanced mode is to be random.

Most computers have a very different type of random number generator, based on a mathematical formula. An initial number, called the random seed, is taken from somewhere. If the seed is entered directly by the user, the series of psuedo-random numbers generated can be repeated, simply by using the same "random" seed. Using the repeatable numbers makes program testing and debugging much simpler.

For truly random results, the random seed must be randomly generated in some manner. On an Atari you

can simply use the built-in random number function. On other computers timing is often used to generate random numbers.

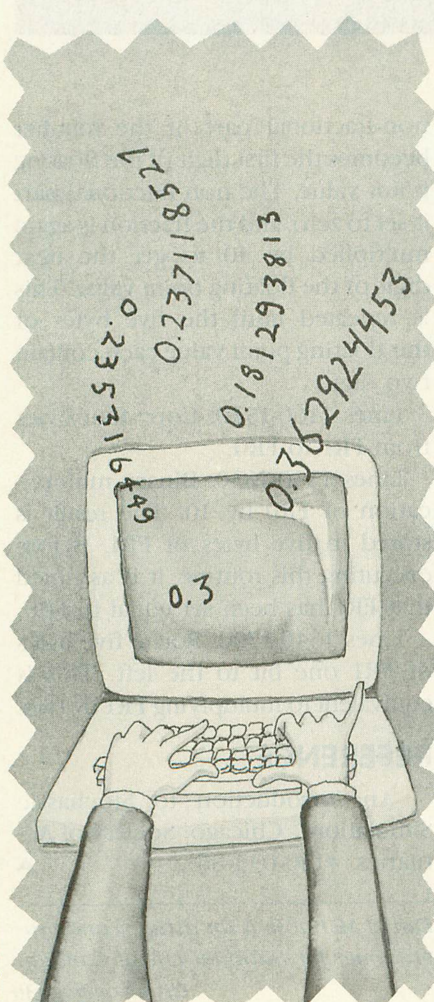
Once a random seed is obtained, the numbers are generated through a simple formula. The random seed value X is multiplied by a constant value C, and then divided by another constant, M. The remainder R is a number between 1 and M-1, and is divided by M to give the the required random value between zero and one. X is then set equal to R, to seed the next random number.

The constants used in this program are:

C = 397,204,094
M = 2^{31}-1 = 2,147,483,647

GETTING STARTED

Type in Listing 1, RANDOM.BAS, check it with TYPO II, and SAVE a copy. If you have trouble with the special characters in lines 20080-20090, 20120, 20140 and 20210, don't type them. Listing 2 will create them for you. Type in Listing 2, check it with TYPO II and SAVE it. When you RUN Listing 2 it creates a file called LINES.LST. Merge this file with Listing 1 by typing LOAD "D:RANDOM.BAS and then ENTER "D:LINES.LST". (Cassette owners use ENTER "C:"). Remember to SAVE the completed program before you RUN it.



Dwight Been

Listing 3, RANDOM.M65, is the MAC/65 source code for the program. You do not need to type it in to use Random Atari.

To RUN Random Atari, you need to set a variable X to a number between zero and M, and then enter GOSUB 20000. The following lines will set X and then call Random Atari.

```
100 X=12345:GOSUB 20000
110 FOR I=1 TO 20:GOSUB
    20200:PRINT I,X:NEXT I
120 END
```

Here, the random seed is 12345. Every time this is RUN, the same 20 random values will be produced. Now try setting X to zero on line 100. The program will generate a truly random seed of its own, and a different 20 values will be produced every time the program is RUN.

The value of X should be set only once in your program, preferably near the beginning. If X is between one and M, then X is the random seed, and the program results can be reproduced by reusing the same value. If X is zero or less, a random seed is chosen using the regular random number generator, and the results will be unpredictable.

Random Atari gives you more than just the option of repeatable random numbers—it also gives you a higher degree of variability. The BASIC RND(0) command can produce only 65,536 distinct values. For some purposes, this is not enough. Random Atari, on the other hand, produces 2,147,483,646 distinct values.

PROGRAM TAKE-APART

Line 20010. The program uses three variables, X$, X(0), and X. These are three different values, in spite of the similarity of their names. On this line, X(0) is set equal to its own address in memory, which is the byte immediately following the address of X$, since they were DIMensioned consecutively.

Line 20020. POKEs the address of X(0) into locations 203 and 204 ($CB and $CC). These are two Page Zero memory locations which BASIC doesn't use.

Line 20060. If X (the random seed) is zero or negative, calculate a new random seed. This will be a value between one and 2^{31}-1.

Line 20065. If X is greater than 2^{31}-2, then set X to equal 2^{31}-2.

Line 20070. Convert the random seed to a four-byte binary number, and store it in memory locations 205-208 ($CD—$D0).

Line 20080. X(0) is set to the address of a machine language routine which copies a section of memory to a new location.

Lines 20090-20150. The machine lanuage random number generator is copied to Page Six in memory locations 1536-1785 ($0600-$06F9).

Line 20160. Return from the initialization routine.

Lines 20200-20210. Call this routine every time you need a random number. These lines call a machine language subroutine which calculates a "pseudo-random" number between zero and one, then places this value in X(0). The variable X is then assigned this value.

ASSEMBLER TAKE-APART

Line 40. The program is compiled at location 25600 ($6400), but everything down to line 280 is fully relocatable.

Lines 50-130. Store the value 397,204,094 as a binary integer in locations 219-222. These locations are

usually referred to as FRE.

Lines 140-180. Move the random seed (or the remainder from the last calculation) from locations 205-208 to locations 213-216 (FR0).

Line 190. Multiply the random seed in FR0 by the constant value in FRE. The result is stored in locations 225-232, FR1. Note that the result of multiplying two four-byte values is an eight-byte value.

Line 200. Calculate the remainder when FR1 is divided by 2^{31}-1. The four-byte result is contained in bytes 229-232 of FR1.

Lines 210-250. Replace the random seed at locations 205-208 with the remainder calculated above for the next calculation.

Lines 260-270. Convert the calculated value from a binary integer to a floating point decimal value between 0 and 1. The value is first doubled by the ROTATL routine, because the routine BTOD assumes we have a value between 1 and 2^{32}-1, where to this point we have calculated a value between 1 and 2^{31}-1.

This routine divides the four-byte binary integer at FR1 by 2^{31}. The random number algorithm actually requires FR1 to be divided by 2^{31}-1, but the difference is negligible.

Line 280. Return to BASIC.

Line 290. The remainder of this program is compiled starting at location 1536 ($0600) and is not relocatable.

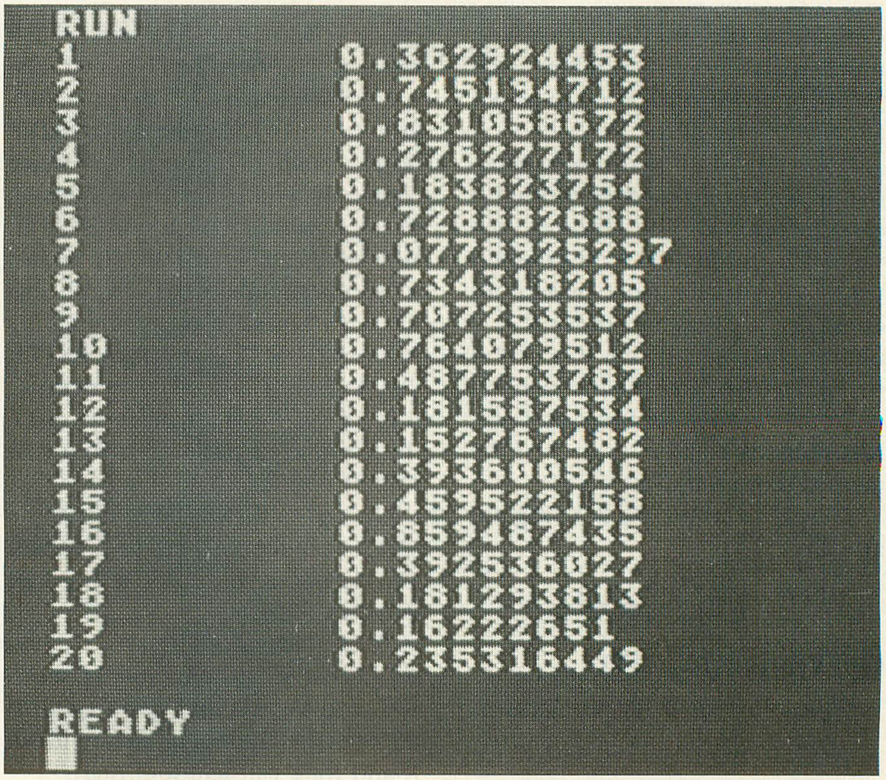
Lines 300-580. Routine to perform binary integer multiplication. Two four-byte integers at FR0 and FRE are multiplied, and the resulting eight-byte value is stored in FR1.

Lines 590-670. Add the contents of FR0 to FR1.

Lines 680-1010. Calculate the remainder when the value at FR1 is divided by 2^{31}-1. A little algebra here saved me from writing a complicated binary division routine.

Let A % B represent the remainder when A is divided by B (as it does in some versions of BASIC), and let $X = M*2^{31} + N$, where $N < 2^{31}$. Then we can say

$$X \% (2^{31}-1) = (M * 2^{31} + N) \% (2^{31}-1)$$
$$= (M + N) \% (2^{31}-1)$$



What started as a complicated division problem is now a simple addition problem. The routine repeatedly adds the top 33 bits of FR1 to the bottom 31 bits of FR1 (M and N from above), until the top 33 bits are all zeroes. The bottom 31 bits contain the required remainder.

Lines 1020-1450. Convert a four-byte binary fraction at FR1 to a floating point decimal number. The result is stored at the six-byte location starting at the byte pointed to by locations 203 and 204. The binary fraction is assumed to be positive, and its 32 bits are assumed to represent halves, quarters, eighths, sixteenths, etc.

The routine repeatedly multiplies the fraction by 10 until it calculates a value greater than 1. Every other time it is multiplied, the exponent of the floating point value is decremented, having started from an initial value of 63.

Once the value exceeds 1, the non-fractional part of the number becomes the first digit of the floating point value. The non-fractional part is set to zero, and the fraction is again multiplied by 10 to get the next digit of the floating point value. This is repeated until the five bytes of the floating point value each contain two digits.

Lines 1460-1520. Copy four bytes from FR1 to FR0.

Lines 1530-1630. Binary multiplication of FR0 by 10. The result is stored in five bytes of FR1. Before executing this routine, it is assumed that FR1 has been set equal to FR0.

Lines 1640-1700. Rotate five bytes of FR1 one bit to the left. This is equivalent to multiplying FR1 by two.

REFERENCE

"An introduction to Stochastic Simulation," Chicago: Society of Actuaries, #130-033-86.

David McIntosh is an actuary and programmer for National Life of Canada.

Listing on page 30

SpartaDOS X or Atari DOS-XE?

Which is Number 1?

BY MATTHEW RATCLIFF

SPARTADOS X

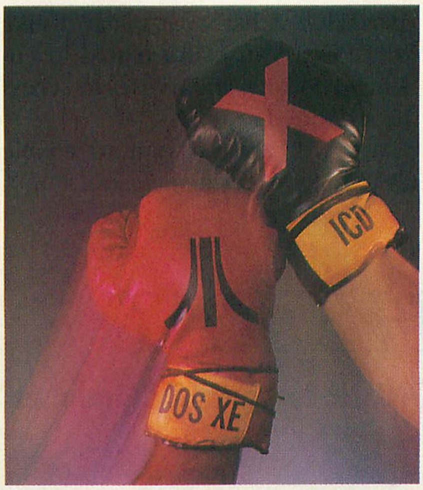
SpartaDOS X, $79.95 from ICD, is *the* ultimate disk operating system for 8-bit Atari computers, bar none! This 64K super cartridge packs power galore. SpartaDOS X even works with the old Atari 800 and will support that computer's Axlon RAM upgrades.

SpartaDOS X is a "piggyback" cartridge, letting you insert a second cartridge on top. The SpartaDOS X cartridge can take complete control of your system, allowing you to access the cartridge on top, such as MAC/65, or run built-in BASIC while the top cartridge is still in place.

SpartaDOS X is a command line DOS, just like its disk-based predecessor. For example, you type DIR D1:*.* to see a directory of all the files on drive number one, instead of selecting a menu option and being prompted for more information. Power users can really fly through their system maintenance once they learn the basic command structure.

SpartaDOS X does have a built-in MENU, which makes it easy for novices to control all the power of this DOS. The MENU does not have the familiar look of Atari DOS, but with a little practice, it is not difficult to master.

The most fascinating feature of SpartaDOS X is that it uses the same



commands as MS-DOS, the disk operating system of IBM PCs. Anyone experienced with a PC or clone will be familiar with the SpartaDOS X commands like CHDIR, DEL, and others. If you don't know how to use an IBM PC, SpartaDOS X will help you learn.

For those who are attached to the older disk-based SpartaDOS, SpartaDOS X retains many of the old commands as "aliases" of the new MS-DOS commands. Some relearning will be required, but not much. For example, you used to type BASIC ON or BASIC OFF to control the internal XL/XE BASIC. Now you simply type BASIC to run the language, which automatically turns off when you enter SpartaDOS X.

The disk format utility XINIT is no longer necessary. From virtually any program making a system call to format a disk (XIO #254), the FORMAT command brings up a SpartaDOS X menu on the screen. For example, when I selected FORMAT from the AtariWriter main menu, the SpartaDOS X format menu popped up instantly. It flawlessly formatted a double sided, double density, high speed I/O, 360K disk on my XF551, and then returned gracefully to AtariWriter with my edit buffer unharmed.

From the format menu of SpartaDOS X, you may select the drive number, format type (including Atari DOS or SpartaDOS), and high speed I/O including ICD's UltraSpeed, Indus high speed, and even the high speed mode of the new Atari XF551 disk drive. Since SpartaDOS X is in a cartridge, this formatter will not write DOS to disk.

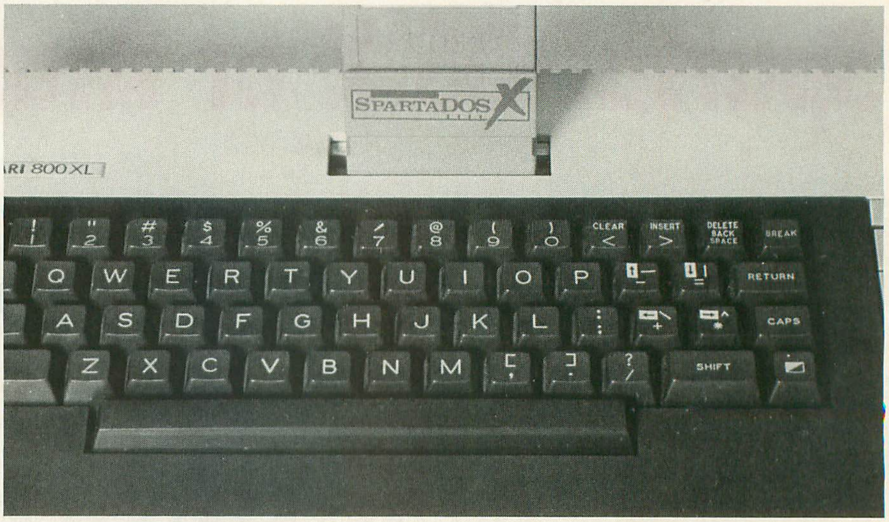
NEW COMMANDS

ARC is a new command in SpartaDOS X, an extremely fast and powerful version of the popular file compression utility. ARC will take one or more files at your request and compress them into one ARC file, by as much as 50% or more.

Using the MS-DOS command structure, SpartaDOS X adds new device names to your Atari. From SpartaDOS X you refer to the printer as PRN: and the keyboard as CON:. SpartaDOS X will not recognize the P: and E: devices you are accustomed to, although they are still accessible from BASIC and other programs.

When you boot with SpartaDOS X, the program looks for a file called CONFIG.SYS. This allows you to hook in custom drivers, making maximum use of your computer configuration. You can tell SpartaDOS X where your extra RAM, if any, can be found, and how much to use for disk buffers. To enable the high speed I/O driver for Indus disk drives, for example, your CONFIG.SYS text command file will specify DEVICE INDUS.SYS/.

The DEVICE ATARIDOS command must be included in CONFIG.SYS to have full access to disks formatted with Atari DOS or its derivatives, such



as MyDOS. Even so, I have found that SpartaDOS X has a particular dislike for DOS 2.5 disks formatted in enhanced density, and refuses to access the extended sectors.

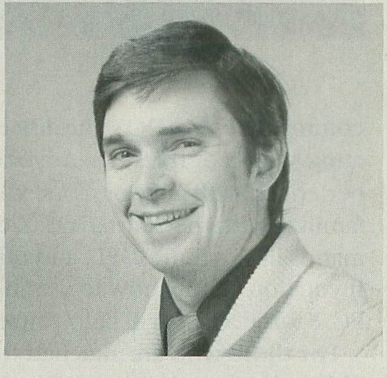
You will always want to enable RAMDISK.SYS, since SpartaDOS X requires a RAMdisk to save the working memory of BASIC or other cartridges. SpartaDOS X saves your working RAM in a manner similar to the MEM.SAV feature of Atari DOS. If SpartaDOS X cannot preserve your working RAM when you enter the

ASK THE RAT

Matthew Ratcliff's ANTIC ONLINE technical Q&A column

Along with this issue's in-depth Matthew Ratcliff reviews of SpartaDOS X and Atari DOS-XE, we thought it would be a good idea to show you a sample of CompuServe's ANTIC ONLINE "Ask The Rat." The technical question answering column is written by Ratcliff under his online handle "MAT*RAT."

Additional excerpts from this valuable column will appear regularly in future **Antic** issues. But for a timelier look at the newest MAT*RAT answers, or to ask your own technical questions, just type GO ANTIC when you log onto the CompuServe online information service. There is no extra charge for using any part of the ANTIC ONLINE electronic magazine.—ANTIC ED



RANDOM ML

Greg Maguire—I'm trying to do some random disk access from ML. How can I NOTE & POINT to a sector & byte using the CIO?

MAT*RAT—Use XIO commands. Do you have MAC/65? In the macro library presented in the back of the manual, an XIO macro is presented. It's virtually identical to the XIO command of BASIC and will work the same. Write a simple NOTE and POINT program in Atari BASIC, get it working, and then go to MAC/65's MACROs. You can do all that NOTE and POINT stuff with XIO commands:

100 NOTE #1,SECT,BYTE

is exactly the same as:

100 XIO 38,#1,SEC, BYTE, "D1:":REM (The string doesn't matter).

and. . .

110 POINT #1,SEC,BYTE

is the same as:

110 XIO 37,#1,SEC,BYTE,

DOS command, you are warned of the condition and given the opportunity to abort and save your file.

It may take a while to become accustomed to all these new drivers, but the default driver, when no CONFIG.SYS file is found, seems to work well.

PROTECT and UNPROTECT have been supplanted with the ATR command. Your file attributes can be set (+) and cleared (-) with this command, including A for archive, H for hidden, and P for protected. ATR + P is used to protect files, and -P will unprotect them.

CHDIR is the change directory command, and SpartaDOS X still fully supports the old CWD, as well as the common MS-DOS abbreviation of CD. Subdirectory path names can be separated by the old greater-than symbol (>) or with the MS-DOS back-slash character (\). MKDIR (also MD) and RMDIR (also RD) make and remove directories, just like the old CREDIR and DELDIR, which are still supported.

SpartaDOS X also includes the PATH command, offered previously on the SpartaDOS Toolkit disk. The PATH command allows you to specify the default search directory for SpartaDOS X. For example, you can place all your external command files (such as FLASHBAK.COM) in a DOS subdirectory on your boot disk and specify PATH D1:\OS in your AUTOEXEC.BAT file. Then, any time you specify a command that is not built into SpartaDOS X, the program automatically searches this path for the file.

HARD DISK HELP

Multiple search paths are allowed. SpartaDOS X also incorporates the Toolkit command PROMPT, which can set the prompt to display the current time, date and directory path if you choose, instead of the simple "D1:". This is an extremely valuable feature for hard disk users who have to keep track of a lot of subdirectories.

SpartaDOS X supports PEEK and POKE commands. They work exactly like their BASIC counterparts. This comes in handy for setting certain defaults, such as screen colors or keyboard repeat rate, from an AUTOEXEC.BAT file, for example.

The UNERASE utility from the Toolkit is built into SpartaDOS X. This is a powerful, immensely useful command. Whenever you accidentally erase the wrong file, simply UNERASE it.

The CHTD command allows you to change the date and time stamps of files. This comes in handy when setting the time stamps of files copied from Atari DOS 2.0 and 2.5 disks, which don't have this feature.

The CHVOL command allows you to change the volume name of a Spar-

---

"D1:":REM (The string doesn't matter).

SERIAL COMMAND

Andy Grey—How long after the CMD line goes low is a command frame sent down the serial line? How long after the command frame is sent does the computer expect to get an ACK or NACK?

MAT*RAT—The SIO bus operates at 19,200 baud. When the PRINT LINE function is called for the SIO handler, first a Device I.D. of $40 is sent, followed by a command byte of $57.

Next is AUX1, which is ignored (your printer could use this as special sub commands or something); followed by AUX2 which is a $4E for normal print or $53 for sideways (I doubt the latter is implemented), followed by a checksum of the previous 4 bytes. The computer then sends the data frame of 40 or 30 bytes (depending on normal, or sideways command respectively) followed by a checksum byte.

UNERASING HELP

Michael Rothstein—There have been occasions where for some reason, while UNERASING.COM a group of files, the CHKDSK showed something like: Total Bytes: 200,000, bytes remaining: 300,000. I know math and there is something wrong. I had to XINIT it (disk 3) and I got something like 184,000 bytes on the RAMdisk. But it was about 8K less than the actual size of the MIO configured RAMdisk. I would rather somehow XINIT it to bring it back to its hefty 192K. From what I have experienced, the only way to do that is by reformatting the entire MIO. Can it be done??

MAT*RAT—No, Mike. There is no way to reformat the MIO RAMdisk without "losing" space. On powerup or when the MIO is reconfigured from your RESET-SELECT menu, all the MIO RAMdisks are "formatted" to their full size.

There is no utility I'm aware of that will "figure out" how many Kbytes a RAMdisk format should return for the MIO. (How often do you FORMAT RAMdisks for Atari DOS 2.5?) The reason you lose Kbytes on the MIO RAMdisk format is that it is configured to be logically identical to a floppy disk, making it easy to make a RAMdisk mirror copy of a floppy.

To restore the RAMdisk to its full size, power cycle MIO (after backing up the files, of course) or reconfigure it from the RESET-SELECT menu (which also makes the MIO "forget" what it had in RAM). ▲

taDOS format disk. The volume name is generally specified at format time, but CHVOL makes it a snap to update. The CHKDSK command is a quick way to find out how much free disk space you have on a specific drive.

My favorite utility from the SpartaDOS Toolkit is WHEREIS.COM. A slightly different version has been implemented in SpartaDOS X, called FIND. It will locate any file or files matching your specification, on any disk in any subdirectory in your system. It can be a lifesaver when you lose track of important files in a maze of directories.

ATARI 800 SUPPORT

The SpartaDOS X cartridge works with the Atari 800, but if you "piggyback" another cartridge on top of it, you won't be able to close the 800's cartridge slot door and engage its safety switch.

To engage the safety switch while the door is open, ICD recommends you carefully squeeze a toothpick or plastic pen cap into the safety switch slot, located about one inch above the [BREAK] key.

BIGGEST WORKSPACE

SpartaDOS X has the lowest LOMEM of any DOS to date, providing more workspace for BASIC and assembly language programs. SpartaDOS X completely *smashes* the limit of 126 files per directory, allowing over 1,400 files in a single directory!

The most frustrating "feature" of the disk based SpartaDOS was the key buffer, which defaults to ON. This type-ahead buffer was great—when it was compatible with your application program. It was not compatible with MAC/65, for example, and could completely lock up your system under certain circumstances. SpartaDOS X also has the KEY command built in, but it mercifully defaults to OFF.

MEM is a handy command for checking total free memory in your computer system. It even displays free banks of RAM in extended memory Ataris.

Initially, SpartaDOS X was not compatible with the Atari XEP80's handler. I talked to ICD, and they responded with a new driver, XEP80.SYS, within 3 days! This driver is currently available on CompuServe, and will be included in future copies of SpartaDOS X.

This amazing little utility allows one program to use both 40 column and 80 column displays. All S: output goes to the 40 column display. E: output is routed to the 80 column display. This allows me to run Express 3.0, Keith Ledbetter's modem program, in 80 columns. All the menus are displayed in the standard 40 columns, but the terminal mode gets the full 80 columns on the XEP80's display.

At this time, SpartaDOS X is still not compatible with TurboWord, the 80 column word processor from Micromiser Software, but ICD is working with Micromiser to solve this problem.The preliminary manual I received with SpartaDOS X was a complete cut-and-dried technical reference. The new manual is more than double the size of the original, providing plenty of information and tutorials for beginners.

SpartaDOS X is the most advanced software and hardware product released for the 8-bit Atari since ICD's Multi I/O interface. It is so large and powerful, I just can't cover all its features in the span of a single review. I have found it to be powerful, bug-free and certainly worth the long wait!

The development of SpartaDOS X was a major accomplishment, and my congratulations go to Tom Harker and the entire ICD staff. SpartaDOS X is the super cartridge no experienced Atarian should be without.

$79.95. ICD Inc., 1220 Rock Street, Rockford, IL 61101.(815) 968-2228.

DOS-XE

Atari's **DOS-XE** ($10) is finally here, about a year after their new XF551 disk drive was released. Now Atari has a disk operating system that fully supports their new drive, producing double-sided, double-density disks with a total of 360K per disk.

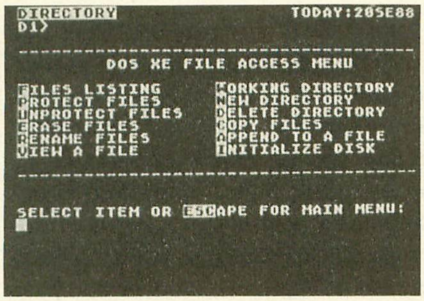
Some of you may recall that Bill Wilkinson of Optimized Systems Software was developing a new A-DOS for Atari. Well, this is it, renamed DOS-XE.

DOS-XE has many new features including multi-density support, subdirectories, date stamping, and even high speed I/O support for the XF551. It will work with any XL or XE computer with an 810, 1050 or XF551 disk drive.

DOS-XE is not compatible with Atari DOS 2.0, nor is it compatible with DOS 2.5 single or enhanced density. This was the major flaw in Atari DOS 3.0 which resulted in its quick and painful death. DOS-XE tries to bridge this gap with support for reading and writing DOS 2 or 2.5 file formats, without the need for running separate "conversion utilities". You simply choose to Allow DOS 2.X access from the appropriate menu.

DOS-XE is both a menu driven and command line DOS. Using the menus, just type the first letter of any command displayed in the current menu. Then, simply follow all the prompts until the command is completed.

If you enter all the information on



a single line, separating each parameter with a single space, DOS-XE can decipher the entire command line and perform the functions without requesting additional input. To look at a [F]iles listing from any of the sub-menus, you can enter a command line as follows:

F D2:*.BAS E:

This command will request DOS-XE to list all the .BAS files from drive 2 to the screen, the E: device. You can just as easily enter the P: parameter to send a file list to the printer.

Because of its sophistication, DOS-XE is broken into three sub-menus, all controlled from a main menu. From the main menu you can go to the File Access, Machine Language Access, or System Function menus. The user may also [E]xit to BASIC or to an external cartridge if installed.

From the System Functions sub-menu, you may elect to [A]llow DOS 2.X access. Once enabled, DOS 2.O or DOS 2.5 disks are accessed as A1: instead of D1:. The letter A tells DOS-XE to use the special Atari DOS 2 handler.

Atari guarantees only that DOS-XE will read DOS 2.0 or 2.5 formats, not *write* them. I find this a serious limitation. However, a SpartaDOS/DOS-XE conversion utility is in the works. ICD is also developing a time stamp driver for DOS-XE which will support the R-Time 8 clock cartridge.

DOS-XE appears to do a good job of bridging the gap from the old to the new Atari DOS format. I found that the [C]opy files command in the File Access menu never works when copying to Atari DOS 2 or 2.5 disks, even when the special handler is enabled. For example, the following command:

C D1:WELCOME.BAS A1:WELCOME.BAS tells DOS-XE to copy the file WELCOME.BAS from the DOS-XE format disk in drive 1 to the Atari DOS 2 or 2.5 format disk in drive 2. However, this always results in an error 168, "command invalid." It is interesting to note that when copying *from* a DOS 2.0 or 2.5 disk to a DOS-XE disk (e.g. from A2:FILE to D1:FILE), DOS-XE can handle the transfer with no problems.

Fortunately, you can save to and load from an Atari DOS 2.0 or 2.5 disk from BASIC, MAC/65, and other language cartridges. Once the Atari DOS 2 handler is enabled, it remains in effect until you reboot your computer.

You can return control to your cartridge and load from or save to a DOS 2 or 2.5 disk by using the letter A to indicate a DOS 2 or 2.5 drive. For example, if drive 2 has an Atari DOS 2.0 disk in it, you would SAVE your file to A2:FILENAME.

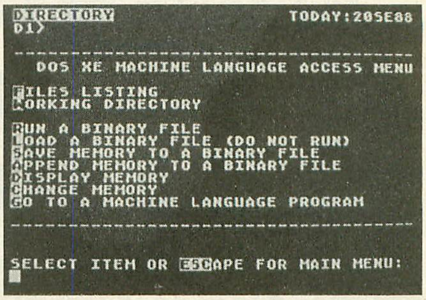
Under the file access menu, you can [P]rotect or [U]nprotect, [E]rase, [R]ename, [V]iew (type text files to the screen), [A]ppend to, and [C]opy files. The really new features are the [W]orking, [N]ew, and [D]elete directory options, used to manage your sub-directories.

SUB-DIRECTORY SERVICES

A sub-directory can be thought of as a disk within a disk, with its own, separate directory listing.

Sub-directories let you organize large numbers of files in a logical manner. With a full 360K on your floppy disks, you may find this feature quite helpful indeed. DOS-XE always displays the current sub-directory at the top of the current menu.

From the File Access menu you may also [I]nitialize disks. If you choose this option you will be prompted for the disk drive number, then for a device type—AT810, AT1050, XF551 or SSDD.



The AT810 format is simply single sided, single density, or about 88K per diskette. The AT1050 is the Atari 1050 enhanced-density format, or about 12.08K per disk. The XF551 uses a "genuine" double-sided, double-density, full 360K disk format.

The SSDD stands for single sided, double density. This lets you create a single sided floppy 180K in size, which can also be booted, read, and written in a 1050 disk drive equipped with ICD's US Doubler, for example.

A command line is allowed here, as it is anywhere else in DOS-XE. For example:

I 1 XF551 tells DOS-XE to format the disk in drive 1 in XF551 (360K) format. You are always prompted to press [START] to continue or [SELECT] to abort, to verify your inputs first.

ML SUPPORT

The Machine Language Access menu lets you manage your binary files, such as data files, or machine language utilities and games. From this menu you may [R]un or [L]oad a binary file and [S]ave or [A]ppend memory to a file.

This menu is handy for patching files in memory with the [D]isplay (a nice memory dump in both hexadecimal and ASCII) and [C]hange memory commands. These can be thought of as sophisticated PEEK and POKE commands.

Once you have patched a file in memory you can save it, or test run it with the [G]o-to command.

The System Function menu lets you [R]un a batch file. A batch file is an

ASCII file filled with commands that you would normally type-in. They can come in handy, assisting you with a lot of the "housekeeping" chores of managing your disks. There is not much information on batch files in the DOS-XE manual, so it is not yet clear just how sophisticated they might be.

DOS-XE requires an XL or XE computer with at least 64K of RAM to run. This DOS is so large that it requires some of the RAM "hidden" under the operating system to work. DOS-XE provides 32,274 bytes of programming space in Atari BASIC Revision C, exactly the same as Atari DOS 2.0.

When the Atari DOS 2 or 2.5 support is enabled in DOS-XE, your BASIC programming space drops to 27,264. Atari DOS 2.0 and 2.5 compatibility comes at the high price of 5,010 bytes of program space.

The advantage to using the extra system memory is that DOS-XE pops up instantly when you enter the DOS command from BASIC or from another cartridge.

The bad news is that Atari 400 and 800 owners have just been served notice that their machines are no longer being supported by Atari. Their only options are ICD's SpartaDOS version 1.1 and the SpartaDOS X cartridge reviewed in this issue, two disk operating systems which take advantage of the XF551's capabilities, while providing 400/800 compatibility.

MORE FLEXIBILITY

The manual for DOS-XE (*by Charles Cherry of Antic Software*—ANTIC ED) is very well done. It starts with the basics, especially for beginners who are new to disk drives and disk operating systems. All the DOS commands and menus are detailed with plenty of examples. The disk-related BASIC commands, including access to advanced features through XIO (extended input and output) commands are explained as well. Sample BASIC and Assembly language programs are presented.

Atari DOS 2.0 and 2.5 were not very flexible. If you wanted to change the number of disk drives supported by either DOS, you had to remember some special POKE commands to enter from BASIC and then write DOS to a new disk. DOS-XE comes with SETUP.COM, a utility which makes it simple to customize it to your particular preferences, including RAMdisk setup.

Except for the one glitch in copying to DOS 2 or 2.5 disks, I found DOS-XE works quite well. Its incompatibility with DOS 2.0 is an unavoidable price to pay for the increased power of sub-directories and date stamping. (Although they should have included a clock driver, allowing time stamping as well.)

Unfortunately, DOS-XE uses a new file format totally alien to SpartaDOS. So, getting from here to there will still require the lowest common denominator of Atari DOS 2.0 or 2.5 in single density format. Because of the new file format, DOS-XE will not be compatible with the current crop of bulletin board systems or most database programs, which require random access files.

I feel that DOS-XE will survive, unlike DOS 3.0, because it does a good job of supporting Atari DOS 2.0 and 2.5 when necessary. However, it isn't as sophisticated as SpartaDOS, which can automatically detect any DOS format it supports.

In conclusion, SpartaDOS is the **power user's** disk operating system. DOS-XE, on the other hand, is much easer to use. Its menu-driven user interface helps novices learn to use it quickly and easily, while the command line controls let power users fly through their DOS operations as well. DOS-XE will support up to 16 megabytes on a single disk, which means that DOS-XE could support a hard drive in the future. ▲

$10. XL/XE with 810, 1050, or XF551 disk drive. Atari Corp., 1196 Borregas Avenue, Sunnyvale, CA 94806. (408) 745-2000.

SOFTWARE LIBRARY

TYPING SPECIAL ATARI CHARACTERS

The Atari Special Characters and the keys you must type in order to get them are shown below:

For [CONTROL] key combination, *hold down* [CONTROL] while pressing the next key. For inverse [CONTROL] [A] through [CONTROL] [Z], press the [◪] key—or [人] on the 400/800—then *release* it before pressing the next key. (Press [◪] or [人] again to turn off inverse.) For [ESC] key combinations, press [ESC] and then *release* it before pressing the next key.

Carefully study the chart above and pay close attention to differences between lookalike characters such as the slash key's [/] and the [CONTROL] [F] symbol [◪].

NORMAL VIDEO

FOR THIS	TYPE THIS	FOR THIS	TYPE THIS
♥	CTRL ,		CTRL S
	CTRL A		CTRL T
	CTRL B		CTRL U
	CTRL C		CTRL V
	CTRL D		CTRL W
	CTRL E		CTRL X
	CTRL F		CTRL Y
	CTRL G		CTRL Z
	CTRL H		ESC ESC
	CTRL I		ESC CTRL −
	CTRL J		ESC CTRL =
	CTRL K		ESC CTRL +
	CTRL L		ESC CTRL *
	CTRL M		CTRL .
	CTRL N		CTRL ;
	CTRL O		SHIFT =
	CTRL P		ESC SHIFT CLEAR
	CTRL Q		ESC DELETE
	CTRL R		ESC TAB

INVERSE VIDEO

FOR THIS	TYPE THIS
	ESC SHIFT DELETE
	ESC SHIFT INSERT
	ESC CTRL TAB
	ESC SHIFT TAB
	人 CTRL .
	人 CTRL ;
	人 SHIFT =
	ESC CTRL 2
	ESC CTRL DELETE
	ESC CTRL INSERT

TYPO II AUTOMATIC PROOFREADER

TYPO II automatically proofreads **Antic**'s type-in BASIC listings. Type in the listing below and SAVE a copy to disk or cassette. Now type GOTO 32000. At the prompt, type in a single program line **without the two-letter TYPO II code at the beginning**. Then press [RETURN].

Your line will reappear at the bottom of the screen. If the TYPO II code does not match the code in the magazine, then you've mistyped your line.

To call back a previously typed line, type [*], then the line number, then [RETURN]. When the completed line appears, press [RETURN] again. This is how TYPO II proofreads itself.

To LIST your program, press [BREAK] and type LIST. To return to TYPO II, type GOTO 32000. To remove TYPO II from your program, type LIST "D:FILENAME",0,31999, then [RETURN], then NEW, then ENTER "D:FILENAME", then [RETURN]. Now you can SAVE or LIST your program to disk or cassette.

Don't type the TYPO II Codes!

```
WB 32000 REM TYPO II BY ANDY BARTON
VM 32010 REM VER. 1.0 FOR ANTIC MAGAZINE
HS 32020 CLR :DIM LINE$(120):CLOSE #2:CLO
   SE #3
BN 32030 OPEN #2,4,0,"E":OPEN #3,5,0,"E"
YC 32040 ? "↖":POSITION 11,1:? "TYPO II "

EM 32050 TRAP 32040:POSITION 2,3:? "Type
   in a program line"
HS 32060 POSITION 1,4:? " ":INPUT #2;LINE
   $:IF LINE$="" THEN POSITION 2,4:LIST B
   :GOTO 32060
XH 32070 IF LINE$(1,1)="*" THEN B=VAL(LIN
   E$(2,LEN(LINE$))):POSITION 2,4:LIST B:
   GOTO 32060
TH 32080 POSITION 2,10:? "CONT"
MF 32090 B=VAL(LINE$):POSITION 1,3:? " ";
NY 32100 POKE 842,13:STOP
CN 32110 POKE 842,12
ET 32120 ? "↖":POSITION 11,1:? " TYPO II 
   ":POSITION 2,15:LIST B
CE 32130 C=0:ANS=C
QR 32140 POSITION 2,16:INPUT #3;LINE$:IF
   LINE$="" THEN ? "LINE ";B;" DELETED":G
   OTO 32050
VV 32150 FOR D=1 TO LEN(LINE$):C=C+1:ANS=
   ANS+(C*ASC(LINE$(D,D))):NEXT D
WJ 32160 CODE=INT(ANS/676)
JW 32170 CODE=ANS-(CODE*676)
EH 32180 HCODE=INT(CODE/26)
BH 32190 LCODE=CODE-(HCODE*26)+65
HB 32200 HCODE=HCODE+65
IE 32210 POSITION 0,16:? CHR$(HCODE);CHR$
   (LCODE)
VG 32220 POSITION 2,13:? "If CODE does no
   t match press  RETURN  and edit line a
   bove.":GOTO 32050
```

DESPERATE ACTION! COMMUTE THROUGH THE TWILIGHT ZONE

DEMON RACER

Article on page 6

LISTING 1

```
;DEMON RACER 1.0
;BY JON PETERSON
;(c)1988, ANTIC PUBLISHING
BYTE CHBASE1,RAM,PMBASE,CHBASE2,
      SPEED=[6],TIMER=[10],LAP=[1],
      GAME=[0],Q=20,SEC=[0],MIN=[0],
      SECH=[9],SECL=[9],MINH=[9],MINL=[9],C=[5],
      CH=[1],B,JOY,HPOS=[95],CARS=[3],
      WSYNC=$D40A,COLBK=$D01A,
      CONSOLE=53279,SECL1=[9],SECH1=[9],
      MINH1=[9],MINL1=[9],SEC1=[99],
      MIN1=[99],Z,C1=[0],D1=[0]
CARD CHSET1,X,PM,CHSET2,DL,SCR,
      TOP,SCRT,SCRB,TIMER2=[3000],
      TIMER3=[1000]
BYTE ARRAY
   CHRS=
   [169 169 165 165 149 149 85 85
    74 74 82 82 84 84 85 85
    85 85 149 149 165 165 169 169
    85 85 84 84 82 82 74 74
    85 85 85 85 85 85 85 85
    170 170 170 170 170 170 170 170
    254 128 128 248 128 128 128 0
    130 130 130 254 130 130 130 0
    254 128 128 142 130 130 254 0],
PMDATA=[24 189 255 165 36 36 165
        255 165 24 60 126 60 60 60
        60 126 36],
CRASH=[85 170 85 170 85 170 85 170 85
       170 85 170 85 170 85 170 85 170],
P=[0 95 130 160],
SPD=[0 3 7 10 20 30 100],
ST=[14 46 48 52 55 58 62],
WINDOW=
[0 0 0 0 36 37 45 47 46 0 0 50 33 35
 37 50 0 0 0 0 0 0 34 57 0 0 42 47 46
 0 48 37 52 37 50 51 47 46 0 0 0 52
 41 45 37 0 0 0 0 0 0 0 0 35 33 50 51 26
 0 0 ],
WINDOW1=
[0 0 0 0 36 37 45 47 46 0 0 50 33 35
 37 50 0 0 0 0 0 0 35 47 53 50 51 37
 0 35 47 45 48 44 37 52 37 36 0 0 0 0
 0 0 48 50 37 51 51 0 51 52 33 50 52
 0 0 0 0 0]
INT Y=[15]
;
;BEGIN IT
;
PROC FONT1()
[0 0 0 0 0 0 0 0
 171 171 171 171 171 171 171 171
 171 171 172 172 176 176 192 192
 170 170 170 170 171 172 176 192
 171 172 176 192 0 0 0 0
 234 58 14 3 0 0 0 0
 170 170 170 170 234 58 14 3
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 3 14 58 234 170 170 170 170
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 0 0 0 0 192 176 172 171
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 0 0 0 0 24 24 0
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 254 134 198 198 198 194 254 0
 24 120 120 88 24 26 254 0
 254 134 6 254 192 194 254 0
 254 130 2 30 2 130 254 0
 198 198 198 254 6 6 6 0
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 254 130 130 124 130 130 254 0
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 252 134 134 252 134 134 252 0
 254 130 128 128 128 130 254 0
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 0 0 16 68 16 0 0 0
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 254 146 16 16 16 146 254 0
 15 2 2 2 130 130 254 0
 0 102 108 120 120 108 102 0
 128 128 128 128 130 130 254 0
 130 198 238 186 146 130 130 0
 194 226 178 154 142 134 130 0
 254 130 130 130 130 130 254 0
 254 130 130 254 128 128 128 0
 0 60 102 102 102 108 54 0
 252 134 134 252 152 140 134 0
 254 128 128 254 2 2 254 0
 254 146 16 16 16 16 56 0
 130 130 130 130 130 130 254 0
 0 102 102 102 102 60 24 0
 0 99 99 107 127 119 99 0
 0 0 0 0 0 0 0 0
 198 108 56 16 16 16 56 0
 0 126 12 24 48 96 126 0
 0 30 24 24 24 24 30 0
 0 64 96 48 24 12 6 0
 0 120 24 24 24 24 120 0
 0 8 28 54 99 0 0 0
 0 0 0 0 0 0 255 0]
RETURN
;
PROC FONT2()
[0 0 0 0 0 0 0 0
 0 0 0 0 0 0 0 0
 0 0 24 24 24 24 0 0
 0 0 0 0 0 0 0 0
 0 0 255 85 85 255 0 0]
RETURN
;
PROC TITLE()
GRAPHICS(0) POKE(559,0)
CHBASE1=PEEK(106)-8
CHSET1=CHBASE1*256
MOVEBLOCK(CHSET1,FONT1,512)
MOVEBLOCK(CHSET1+24,CHRS,72)
POKE(756,CHBASE1)
POKE(752,1)
SETCOLOR(2,8,3) SETCOLOR(4,8,3)
SETCOLOR(1,0,15)
;PRINT OUT MESSAGE
POSITION(0,0) PRINT("  TIME   ")
PRINTB(MINH) PRINTB(MINL)
PRINT(":") PRINTB(SECH) PRINTB(SECL)
PRINT("             BEST TIME   ")
PRINTB(MINH1) PRINTB(MINL1)
PRINT(":") PRINTB(SECH1) PRINTBE(SECL1)
POKE(82,5) PRINTE(" ")
PRINTE("((((((((((((((((((((((((")
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PRINTE("((((((((((((((((((((((((")
POKE(82,14) PRINTE(" ") PRINTE(" ")
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PRINTE("(&(%(&(%(%'&(%'$(&(%(")
PRINTE("((((((((((((((((((((((")
PRINTE(" ")
PRINTE("        BY JON PETERSON")
POKE(82,7) PRINTE(" ") PRINTE(" ")
PRINTE(" [C] 1988 ANTIC PUBLIS*IN+")
PRINTE("PRESS START OR >IRE TO PLAY")
POSITION(12,23)
PRINT("AN ACTION PRO+RAM")
POKE(559,34) MIN=0 SEC=0 GAME=0
DO
UNTIL CONSOLE=6 OR STRIG(0)=0 OD
RETURN
;
PROC SETRAM()
RAM=PEEK(106)-32
CHSET1=RAM*256
CHBASE1=RAM
PMBASE=RAM+4
PM=PMBASE*256
CHBASE2=RAM+8
CHSET2=CHBASE2*256
DL=(RAM+12)*256
SCR=(RAM+16)*256
SCRT=SCR+80
SCRB=SCR+3680
TOP=(RAM-2)*256
POKE(106,RAM-2)
GRAPHICS(0) POKE(559,0)
ZERO(TOP,8704)
POKE(82,0)
RETURN
;
PROC DLI()
[$48 $8A $48 $98 $48]
WSYNC=1
COLBK=C
[$68 $A8 $68 $AA $68 $40]
RETURN
;
PROC DLIST()
FOR X=0 TO 2 DO
  POKE(DL+X,112) OD
POKE(DL+3,71)
POKEC(DL+4,WINDOW)
POKE(DL+6,7)
POKE(DL+7,7)
POKE(DL+8,16+128)
POKE(DL+9,101)
POKEC(DL+10,SCR)
FOR X=12 TO 20 DO
  POKE(DL+X,37) OD
POKE(DL+21,5)
POKE(DL+22,65)
POKEC(DL+23,DL)
POKEC(560,DL)
POKEC(512,DLI)
POKE(54286,192)
RETURN
;
;
PROC PMSETUP()
POKE(54279,PMBASE) POKE(53277,3)
POKE(53248,0) POKE(53249,0)
POKE(53256,0) POKE(53257,0)
POKE(704,0) POKE(705,15)
MOVEBLOCK(PM+512+97,PMDATA,9)
MOVEBLOCK(PM+640+97,PMDATA+9,9)
POKE(623,1)
RETURN
;
PROC SETLOAD()
MOVEBLOCK(CHSET1,FONT1,512)
MOVEBLOCK(CHSET2,FONT1,512)
MOVEBLOCK(CHSET2+(28*8),FONT2,8)
MOVEBLOCK(CHSET2+(32*8),FONT2+8,8)
MOVEBLOCK(CHSET2+(38*8),FONT2+16,8)
MOVEBLOCK(CHSET2+(39*8),FONT2+24,8)
MOVEBLOCK(CHSET2+(56*8),FONT2+32,8)
CH=1 POKE(756,CHBASE1)
RETURN
;
INCLUDE "D:SCREEN.ACT"
;
PROC SCRLOAD()
MOVEBLOCK(SCR+1,SCREENDATA,4080)
RETURN
;
;
PROC TOGGLESET()
TIMER2==+1
IF TIMER2>500 THEN
  TIMER2=0
  IF CH=2 THEN
    POKE(756,CHBASE1) CH=1
  ELSE IF CH=1 THEN
    POKE(756,CHBASE2) CH=2
  FI
 FI
FI
RETURN
;
;
PROC SCROLL()
IF SPD(SPEED)=100 THEN RETURN FI
TIMER==-1
IF TIMER<>0 THEN RETURN FI
Y==-1
IF Y>-1 THEN
  POKE(54277,Y) TIMER=SPD(SPEED)
  RETURN FI
Y=15
SCR==-40 POKE(54277,15)
POKEC(DL+10,SCR)
TIMER=SPD(SPEED)
IF LAP=3 AND (SCR-200)<=SCRT THEN
   GAME=2 FI
RETURN
;
;
PROC LAPS()
IF SCR=SCRT THEN
  LAP==+1
  SCR=SCRB FI
IF LAP<>4 THEN
  POKEC(DL+10,SCR) FI
;IF LAP=4 THEN GAME=1 FI
RETURN
;
;
PROC TIME()
IF Q>=60 THEN
  SEC==+1 Q==-60 FI
IF SEC>=60 THEN
  MIN==+1 SEC=0 FI
SECH=SEC/10
SECL=SEC MOD 10
MINH=MIN/10
MINL=MIN MOD 10
WINDOW(46)=MINH+16
WINDOW(47)=MINL+16
WINDOW(48)=26
WINDOW(49)=SECH+16
WINDOW(50)=SECL+16
WINDOW(58)=16+CARS
RETURN
;
;
PROC MOVPL()
JOY=STICK(0) SOUND(0,ST(SPEED),6,6)
TIMER3==+1
IF TIMER3>15 THEN TIMER3=0
    IF JOY=7 OR JOY=6 THEN HPOS==+1 FI
    IF JOY=11 OR JOY=10 THEN HPOS==-1 FI
    POKE(53248,HPOS) POKE(53249,HPOS)
    IF JOY=14 THEN
      SPEED==-1
      IF SPEED<1 THEN SPEED=1 FI
    FI
    IF STRIG(0)=0 OR JOY=13 THEN SPEED==+1
      IF SPEED>6 THEN SPEED=6 FI
      FI
FI
RETURN
;
;
PROC COLLISION()
IF PEEK(53252)#0 THEN
    CARS==-1
    IF CARS>3 THEN GAME=1 FI
    ;CONTINUE SCROLL FOR A WHILE
     FOR X=0 TO 200 DO
      MOVEBLOCK(PM+512+97,CRASH,9)
      SCROLL() SOUND(0,220,2,12)
      FOR Z=0 TO 200 DO OD
      SNDRST()
      MOVEBLOCK(PM+512+97,CRASH+9,9)
      OD
    FOR X=0 TO 50000 DO OD
    HPOS=P(LAP)
    POKEC(DL+10,SCRB) POKE(53248,HPOS)
    POKE(53249,HPOS) SCR=SCRB
```

continued on next page

```
    MOVEBLOCK(PM+512+97,PMDATA,9)
    SPEED=6 POKE(54277,15) Y=15
    POKE(53278,255)
    FOR X=0 TO 5000 DO OD
    SNDRST()
    DO UNTIL STICK(0)<>15 OD
Q=Z
FI
RETURN
;
PROC MAIN()
DO
TITLE() MIN=0 SEC=0
SETRAM()
DLIST()
PMSETUP()
SETLOAD()
SCRLOAD() SETCOLOR(2,8,3)
SETCOLOR(1,12,7) SETCOLOR(0,0,15)
SETCOLOR(4,1,2) SETCOLOR(3,7,5)
SCR=SCRB POKE(559,42)
POKEC(DL+10,SCRB)
POKE(54277,15) POKE(53248,HPOS)
POKE(53249,HPOS)
DO Q=0 UNTIL STICK(0)<>15 OD
DO
IF PEEK(764)=33 THEN Z=Q
    DO UNTIL PEEK(764)<>33 OD Q=Z FI
TOGGLESET()
POKE(53278,255) SCROLL() COLLISION()
LAPS()
TIME()
POKE(53278,255) MOVPL() COLLISION()
UNTIL GAME=1 OR GAME=2 OD
IF GAME=2 THEN SNDRST()
    POKEC(DL+4,WINDOW1)
    DO
    C=RAND(255)
    Z=RAND(255)
    SOUND(0,C,10,8) SOUND(1,Z,2,6)
    IF C=11 AND Z<50 THEN POKEC(DL+4,WINDOW) FI
    IF C=69 AND Z>205 THEN POKEC(DL+4,WINDOW1) FI
    UNTIL CONSOLE=6 OD
FI
POKE(106,160) LAP=1 HPOS=95
POKE(53248,0) POKE(53249,0)
CARS=3 C=5
SNDRST()
IF GAME=2 THEN
    IF MIN<MIN1 THEN
        MINH1=MINH MINL1=MINL
        SECL1=SECL SECH1=SECH
        SEC1=SEC MIN1=MIN FI
    IF MIN=MIN1 AND SEC<SEC1 THEN
        MINH1=MINH MINL1=MINL
        SECH1=SECH SECL1=SECL
        SEC1=SEC MIN1=MIN FI
ELSE IF GAME=1 THEN SEC=99 MIN=99
        SECL=9 SECH=9
        MINL=9 MINH=9 FI
FI
OD
RETURN
```

LISTING 2

```
;DEMON RACER, LISTING 2
;BY JON PETERSON
;(c)1988, ANTIC PUBLISHING
PROC SCREENDATA()
;
[0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
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0 0 0 0 8 1 0 0 0 0 0 0 8 1 0
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30 8 1 0 0 0 0 0 0 8 1 0 0 0 0
0 0 8 1 0 0 0 0 0 0 8 1 30 30 30
30 30 30 30 30 30 30 30 30 30 30 8 1 0 0
0 0 0 0 8 1 0 0 0 0 0 0 8 1 0
0 0 0 0 0 8 1 30 30 30 30 30 30 30 30
30 30 30 30 30 30 8 1 0 0 0 0 0 0 8
1 0 0 0 0 0 0 8 1 0 0 0 0 0 0
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30 30 30 30 27 2 0 0 0 0 11 10 27 1 0
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30 27 2 0 0 0 0 9 27 30 27 2 0 0 0
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8 27 27 27 30 30 30 30 30 30 30 0 0 0 0
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28 28 26 30 30 30 30 30 30 30 30 30 0 0 0
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30 30 30 30 30 13 0 0 0 30 30 30 30 30 158
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27 27 2 0 0 0 0 0 0 8 27 27 158 158 158
158 27 27 27 27 13 0 0 0 0 0 7 27 27 13
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0 0 0 9 27 27 27 158 158 158 158 27 27 27 27
27 13 0 0 0 0 0 7 27 27 13 0 0 0 0
7 27 27 27 27 2 0 0 0 0 0 11 10 27 27
27 27 158 158 158 158 27 27 27 27 27 27 13 0 0
0 0 0 7 27 1 0 0 0 0 0 7 27 27 2
0 0 0 0 0 9 27 27 27 27 27 27 158 158 30
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30 8 1 0 0 0 0 0 0 8 1 0 0 0 0
0 0 8 1 0 0 0 0 0 0 8 1 30 30 30
30 30 30 30 30 30 30 30 30 30 30 8 1 0 0
0 0 0 0 8 1 0 0 0 0 0 0 8 1 0
0 0 0 0 0 8 1 30 30 30 30 30 30 30 30
30 30 30 30 30 30 8 1 0 0 0 0 0 0 8
1 0 0 0 0 0 0 8 1 0 0 0 0 0 0
8 1 30 30 30 30 30 30 30 30 30 30 30 30 30
30 8 1 0 0 0 0 0 0 8 1 0 0 0 0
0 0 8 1 0 0 0 0 0 0 8 1 30 30 30
30 30 30 30 30 30 30 30 30 30 30 8 1 0 0
0 0 0 0 8 1 0 0 0 0 0 0 8 1 0
0 0 0 0 0 8 1 30 30 30 30 30 30 30 30
30 30 30 30 30 30 8 1 0 0 0 0 0 0 8
1 0 0 0 0 0 0 8 1 0 0 0 0 0 0
8 1 30 30 30 30 30 30 30 30 30 30 30 30 30
30 8 1 0 0 0 0 0 0 8 1 0 0 0 0
0 0 8 1 0 0 0 0 0 0 8 1 30 30 30
30 30 30 30 30 30 30 30 30 30 30 8 1 0 0
0 0 0 0 8 1 0 0 0 0 0 0 8 1 0
0 0 0 0 0 8 1 30 30 30 30 30 30 30 0]
;
RETURN
```

POWERFUL BASIC DISK UTILITY COLLECTION

ANTIC-PAK

Article on page 40

LISTING 1

Don't type the TYPO II Codes!

```
NX 10 REM ANTIC-PAK
TQ 12 REM BY EUGENE KOH
QN 14 REM (c)1988, ANTIC PUBLISHING
XO 16 GRAPHICS 0:POKE 559,0:DL=256*PEEK(5
   61)+PEEK(560):POKE DL+3,71:POKE DL+6,6
   :POKE DL+7,6:POKE 710,144
RH 18 POKE 712,102:POKE DL+8,7:POKE DL+22
   ,5:POKE DL+23,6:POKE DL+24,6:POKE DL+2
   5,6
CQ 20 POKE DL+26,65:POKE DL+27,PEEK(560):
   POKE DL+28,PEEK(561):? "  ANTIC-PAK":?
    "BY V. EUGENE KOH"
OM 22 WVFLG=PEEK(1913)
DB 24 ? "   Convert File to BASIC Loader"
   :?
DQ 26 ? "  DIR Command Creator":?
HX 28 ? "  Eighty-Column Disk Directory":?
VL 30 ? "  File Management Helper":?
DB 32 ? "  Garbage Remover":?
TI 43 ?
BD 46 ? "       your choice  ":POKE 708,206
   :POKE 709,14:POKE 711,78:? " (C)1988 A
   NTIC":POKE 559,34
YS 48 OPEN #1,4,0,"K:":GET #1,JNK:CLOSE #
   1
BT 50 IF JNK<67 OR JNK>71 THEN ? " ";:GOT
   O 48
UE 52 JNK=JNK-66:ON JNK GOTO 1100,200,100
   0,300,800
HU 200 GRAPHICS 0:? :? "DIR COMMAND MAKER
   ":CLOSE #3:OPEN #3,8,0,"D1:DIR":DIM QQ
   $(68)
VT 202 QQ$="CLR:DIMA$(50):?:?:OP.#1,7,0,X
   D:*.*X:F.A=1TO99:IN.#1;A$:?A$;X   X;:N.
   A"
ZY 204 QQ$(29,29)=CHR$(34):QQ$(35,35)=CHR
   $(34):QQ$(60,60)=CHR$(34):QQ$(63,63)=C
   HR$(34)
UY 206 ? #3;QQ$:CLOSE #3
DI 208 ? "Use ENTER";CHR$(34);"D:DIR to g
```

continued on next page

```
   et a":? "disk diretory anytime. When you see"
KJ 210 ? "the ERROR 136, type END or CLOSE #1.":END
VS 300 GOSUB 362:POKE 1913,87:POKE 65,0:DIM F$(50),N$(50),X$(50)
YL 302 ? "D = Delete File";CHR$(127);"L = Lock File"
VD 304 ? "R = Rename File";CHR$(127);"U = Unlock File"
IO 306 ? "ESC = Go back     RETURN = No Changes"
AJ 308 ? :? :? "Insert work disk into drive one and":? "press START to begin...";:POKE 559,34
OM 310 ON PEEK(53279)<>6 GOTO 310:OPEN #2,4,0,"K:":JNK=1
IH 312 GOSUB 362:? "L Filename Ext Size":? :OPEN #1,7,0,"D:*.*"
ZH 314 FOR FNS=1 TO JNK:INPUT #1,F$:NEXT FNS
GQ 316 ON F$(7,9)="EE " GOTO 352:JNK=JNK+1:? F$(1,10);CHR$(46);F$(11);"     ";:POKE 559,34
IL 318 GET #2,SEL:IF SEL=155 THEN GOSUB 362:? "L Filename Ext Size":? :INPUT #1,F$:GOTO 316
ZG 320 IF SEL=27 THEN JNK=JNK-2:IF JNK<1 THEN JNK=1
PC 322 IF SEL=27 THEN CLOSE #1:GOTO 312
TS 324 ON SEL<>68 AND SEL<>76 AND SEL<>82 AND SEL<>85 GOTO 318
PE 326 POKE 559,0:N$="D:":FOR PSN=3 TO 10:IF F$(PSN,PSN)=CHR$(32) THEN NEXT PSN:GOTO 330
BO 328 N$(LEN(N$)+1)=CHR$(ASC(F$(PSN,PSN))):NEXT PSN
IO 330 ON F$(11,13)="    " GOTO 336:N$(LEN(N$)+1)=CHR$(46)
FG 332 FOR PSN=11 TO 13:IF F$(PSN,PSN)=CHR$(32) THEN NEXT PSN:GOTO 336
BE 334 N$(LEN(N$)+1)=CHR$(ASC(F$(PSN,PSN))):NEXT PSN
LP 336 IF SEL=68 THEN ? "DELETE":? :? "Okay to delete? ";:POKE 559,34:GET #2,OK:ON OK<>89 GOTO 344:POKE 559,0
XE 338 ON SEL=82 GOTO 346:IF SEL=68 THEN XIO 33,#3,0,0,N$:JNK=JNK-1:GOTO 344
PF 340 IF SEL=76 THEN XIO 35,#3,0,0,N$:GOTO 344
PG 342 XIO 36,#3,0,0,N$
BK 344 CLOSE #1:GOTO 312
FM 346 POKE 559,34:? "RENAME":? :? "Enter new filename:":INPUT #16,X$
RS 348 POKE 559,0:N$(LEN(N$)+1)=CHR$(44):N$(LEN(N$)+1)=X$
YW 350 XIO 32,#3,0,0,N$:CLOSE #1:GOTO 312
RB 352 GOSUB 362:CLOSE #1:OPEN #1,7,0,"D:*.*":TRAP 358:? "CURRENT FILE DIRECTORY:"
JD 354 ? :? "L Name     Ext Size L Name     Ext Size":? :POKE 559,34
FH 356 INPUT #1,F$:? F$;CHR$(32);CHR$(32);:GOTO 356
JP 358 CLOSE #1:? :? :? "DONE! Press RESET to quit, or"
VG 360 ? "SELECT to restart this program...";:POKE 1913,WVFLG:GOTO 376
EN 362 GRAPHICS 0:POKE 559,0:POKE 710,192:POKE 712,146
KI 364 ? :? "          FILE MANAGEMENT HELPER"
DK 366 ?
ZO 368 ? :? :TRAP 370:RETURN
SL 370 ON PEEK(195)=136 GOTO 352
GX 372 GOSUB 362:? "ERROR # ";PEEK(195);CHR$(253)
OB 374 ? :? "Press SELECT to restart program...";:POKE 53279,34:POKE 1913,WVFLG
LK 376 ON PEEK(53279)<>5 GOTO 376:RUN
HW 800 GRAPHICS 0:TRAP 830:POKE 559,0:RESTORE 802:FOR A=708 TO 712:READ B:POKE A,B:NEXT A
TH 802 A=PEEK(560)+PEEK(561)*256:DATA 70,12,160,198,160
LM 804 POKE A+6,7:POKE A+7,6:POKE 65,0:? :DIM F$(50)
QT 806 ? "GARBAGE REMOVER           by eugene koh":? :?
BY 808 ? "File to process: ":POKE 559,34:INPUT #16,F$:IF F$="" THEN RUN
YZ 810 POKE 752,1:? :? :? "Press START to begin."
SJ 812 ON PEEK(53279)<>6 GOTO 812:GRAPHICS 0:POKE 559,0:POKE 77,128:POKE 1913,87
KL 814 ? :? :? "LOAD ";CHR$(34);F$
CT 816 ? :? :? "LIST ";CHR$(34);F$
ME 818 ? :? :? :? "NEW ":? :? :? "ENTER";CHR$(34);F$
TI 820 ? :? :? "SAVE ";CHR$(34);F$
FS 822 ? :? :? "POKE 77,0:POKE 65,3:POKE 1913,87"
CC 824 ? :? :? "POKE 842,12:GR.0:NEW"
IA 826 POSITION 2,0
GK 828 POKE 842,13:POKE 1913,WVFLG:END
PU 830 GRAPHICS 0:? :? "Error # ";PEEK(195)
NJ 832 POKE 77,0:POKE 842,12:POKE 710,0
UB 834 ? :? "Press OPTION to start over..."
KP 836 ON PEEK(53279)<>3 GOTO 836:RUN
LJ 1000 GRAPHICS 0:? :? "Enter disk title:":? :? ">>> ";:DIM A$(100),B$(100):INPUT #16;A$:LPRINT A$:LPRINT
FT 1002 CLOSE #1:OPEN #1,7,0,"D:*.*"
OM 1004 FOR V=1 TO 4:INPUT #1;A$:B$(LEN(B$)+1)=A$:IF A$(5,9)="FREE " THEN POP :LPRINT B$:CLOSE #1:END
SU 1006 B$(LEN(B$)+1)="   ":NEXT V:LPRINT B$:B$="":GOTO 1004
BQ 1100 DIM A$(100),B$(100),C$(100):CLOSE #1:OPEN #1,4,0,"K:"
BD 1102 GOSUB 1176:? "Insert disk into drive":? "and press <RETURN>... ";:GET #1,JUNK
PS 1104 GOSUB 1176:TRAP 1108:OPEN #2,7,0,"D1:*.*"
VQ 1106 INPUT #2,A$:? A$;"  ";:GOTO 1106
US 1108 IF PEEK(195)<>136 THEN 1182
CQ 1110 CLOSE #2:? :? :? :? "Press <SPACE BAR> to continue... ";:GET #1,JUNK
EP 1112 GOSUB 1176
TI 1114 ? "Enter filename of program to convert:":INPUT #16,B$:A$="D1:":A$(4)=B$
LY 1116 IF B$="" THEN ? "↑↑";:GOTO 1114
XN 1118 ? :? "Enter filename for new program:":INPUT #16,C$:B$="D1:":B$(4)=C$
SV 1120 IF C$="" THEN ? "↑↑↑";:GOTO 1118
JU 1122 ? :? "Enter line number to start at:":INPUT #16,LN:IF LN<0 OR LN>10000 THEN ? "↑↑↑";:GOTO 1122
LI 1124 ? :? "Enter increment: 10←←";:INPUT #16,I:IF I<1 OR I>50 THEN ? "↑↑↑";:GOTO 1124
XP 1126 ? :? "Press <RETURN> when ready to begin. ";:GET #1,JUNK
WG 1128 GRAPHICS 18:POSITION 5,4:? #6;"WORkING...":POKE 65,0
DA 1130 OPEN #2,4,0,A$:OPEN #3,8,0,B$
TO 1132 ? #3;LN;"GR.0:?:?";CHR$(34);"CHECKSUM LOADER BY EUGENE KOH";CHR$(34);":OPEN #3,8,0,";CHR$(34);A$:LN=LN+I
OH 1134 ? #3;LN;" READ A:IF A=-1 THEN CLOSE #3:GOTO ";LN+I+I:PZ=LN+I+I:LN=LN+I
VV 1136 ? #3;LN;" PUT #3,A:CNT=CNT+A:GOTO ";LN-I:LN=LN+I+I+I
XL 1138 TRAP 1144:? #3;LN;" DATA ";
CD 1140 FOR DA=1 TO 15:GET #2,N:PCT=PCT+N:? #3;N;:IF DA<15 THEN ? #3;",";
RG 1142 NEXT DA:LN=LN+I:? #3:GOTO 1138
QG 1144 IF PEEK(195)<>136 THEN CLOSE #2:CLOSE #3:POP :GOTO 1182
SO 1146 ? #3;"-1":? #3;PZ;" IF CNT<>";PCT;" THEN ?CHR$(253);";CHR$(34);"ERROR IN DATA STATEMENTS!";CHR$(34);":END"
QG 1148 ? #3;PZ+I;" ?";CHR$(34);"NO ERRORS."
QW 1150 CLOSE #2:CLOSE #3:POP
QW 1152 GOSUB 1176:? " ALL DONE! ":? :? "Please choose:":?
QF 1154 ? " A Exit to DOS":? " B Exit to BASIC":? " C Start over":?
RB 1156 ? "Please enter your choice:    ←←";
BA 1158 GET #1,AD:IF AD<65 OR AD>67 THEN 1158
NR 1160 ? CHR$(AD+128);"→";:AD=AD-64:ON AD GOTO 1162,1164,1186
EU 1162 CLOSE #1:DOS
UA 1164 CLOSE #1:GRAPHICS 0
NB 1166 GRAPHICS 0:? :? "Enter disk title:":? :? ">>> ";:DIM A$(100),B$(100):INPUT #16;A$:LPRINT A$:LPRINT
MY 1168 OPEN #1,7,0,"D:*.*"
```

```
OT 1170 FOR V=1 TO 4:INPUT #1;A$:B$(LEN(B
   $)+1)=A$:IF A$(5,9)="FREE " THEN POP :
   LPRINT B$:CLOSE #1:END
BI 1172 B$(LEN(B$)+1)="  ":NEXT V:LPRINT
   B$:B$="":GOTO 1170
GA 1174 END
VV 1176 GRAPHICS 0:POKE 710,196:POKE 712,
   196:POKE 709,15
SP 1178 ? "         ▮TRANSFER FILE TO DATA▮
   ▮":? "            By Eugene Koh"
RB 1180 ? "⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟
   ⊟⊟⊟⊟⊟⊟⊟⊟":? :TRAP 1182:RETURN
RL 1182 GOSUB 1176:? "ERROR # ";PEEK(195)
   ;"▣":?
ZS 1184 ? "Press <SPACEBAR> to restart...
   ";:GET #1,JUNK
OK 1186 RUN
GT 1188 END
```

ALL THE CARDS ARE FACE UP, SO THERE'S NO EXCUSE

BAKER SOLITAIRE

Article on page 10

LISTING 1

Don't type the TYPO II Codes!

```
LL 10 REM BAKER SOLITAIRE
WL 12 REM BY TOM CLINE
QP 15 REM (c)1988, ANTIC PUBLISHING
LO 20 CLOSE #1:OPEN #1,4,0,"K:":GOTO 30
QH 22 WIN=0:ON SUITS-1 GOTO 24,25,26
QK 24 X=USR(BAND,PEEK(SCR+TL),63):WIN=(X=
   43):RETURN
RZ 25 X=USR(BAND,PEEK(SCR+13),PEEK(SCR+TR
   ),63):WIN=(X=43):RETURN
YQ 26 X=USR(BAND,PEEK(SCR+TL),PEEK(SCR+13
   ),PEEK(SCR+TR),63):WIN=(X=43):RETURN
JQ 30 DIM CARD$(52),TEMCRD$(1),CN(254),BR
   (20),A$(20),B$(20),C$(20),D$(20),F$(20
   ),BLINK$(20),UNSHUF$(52)
WC 40 DIM BEFCOL$(300),BEFROW$(300),AFTCO
   L$(300),AFTROW$(300),CRDREM$(300),MARK
   (10),BAN$(22)
EK 45 BAN$="h▣▣▣▣▣▣h%▣▣▣h%▣▣▣▣▣▣▣":BAND=
   ADR(BAN$)
DC 50 CARD$="A23456789TJQKa⊟⊞●▬▯⊤⊥▯tjqk▣▣
   ▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣":UNSHUF$=CARD
   $:REM DECK OF UNSHUFFLED CARDS
RJ 60 FOR K=1 TO 52:CN(ASC(CARD$(K,K)))=K
   :NEXT K:REM POSITION OF A CARD IN CARD
   $
NH 70 IF PEEK(1536)=72 THEN 120
JT 80 RESTORE 80:FOR K=0 TO 61:READ BYTE:
   POKE 1536+K,BYTE:NEXT K:REM DLI FOR LO
   WER CASE LETTERS
XA 90 DATA 72,169,12,141,10,212,141,22,20
   8,169,86,141,23,208,169,0,141,24,208,1
   69,226,141,9,212,169
HA 100 DATA 31,141,0,2,104,64,72,169,224,
   141,10,212,141,9,212,169,36,141,22,208
   ,169,198,141,23,208
QC 110 DATA 169,148,141,24,208,169,0,141,
   0,2,104,64
NJ 120 GRAPHICS 17:POKE 712,224
QL 130 REM NUMBER OF SUITS
QS 140 D$="▯":D$(13)=D$:D$(2)=D$
PY 150 POSITION 3,4:? #6;D$:POSITION 3,5:
   ? #6;"enter ▣▣▣or ▣"
MS 160 POSITION 3,6:? #6;"for the number"
   :POSITION 3,7:? #6;"of suits▯":POSITIO
   N 3,8:? #6;D$
WA 170 GET #1,R:GOSUB 1160
JC 180 IF R<50 OR R>52 THEN 120
CX 190 SUITS=R-48:ST=SUITS:REM ST IS NUMB
   ER OF EMPTY PARKING SPACES (GOLD STARS
   )
CV 200 REM DLI FOR L.CASE LETTERS
QZ 210 GRAPHICS 17:POKE 712,12:POKE 708,3
   6:POKE 709,198:POKE 711,8
VU 220 MOVE=1:ER=-1:PLACE=0:BL=0:TRUE=1:F
   ALSE=0:MOVGRP=FALSE:GRAPH=FALSE:MARK=F
   ALSE
WI 230 DMA=PEEK(559):POKE 559,0:SCR=PEEK(
   88)+PEEK(89)*256
JW 240 DL=PEEK(560)+256*PEEK(561):POKE DL
   +6,134:POKE DL+9,134
AW 250 POKE 512,0:POKE 513,6:POKE 54286,1
   92
AL 260 REM INIT & DISPLAY LC LETTERS & ST
   ARS
FW 270 S=SUITS
SP 280 IF S=4 THEN A$="     ****    ▣▣▣▣":B
   $="  P            t  ":C$="        jklm
   wxyz":F$="   a b c d e f g h"
ET 290 IF S=4 THEN D$="  ⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟
   "
RK 300 IF S=4 THEN FL=2:REM L.COL. OF FIE
   LD
UR 310 IF S=4 THEN TL=11:TR=14:REM L.&R.
   COLS. OF TERM
JG 320 IF S=4 THEN PL=4:PR=7:REM L.&R. CO
   LS. OF PARKING
LB 330 IF S=3 THEN A$="      ***    ▣▣▣":B
   $="   P           t":C$="        jkl
   wxy":F$="    a b c d e f g"
HG 340 IF S=3 THEN D$="    ⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟"
RR 350 IF S=3 THEN FL=4:TL=12:TR=14:PL=6:
   PR=8
ZX 360 IF S=2 THEN A$="      **    ▣▣":B$=
   "   P          t":C$="       jk    wx":F
   $="    a b c d e f"
FY 370 IF S=2 THEN D$="    ⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟⊟"
ML 380 IF S=2 THEN FL=4:TL=11:TR=12:PL=6:
   PR=7
PC 390 ? #6;A$:? #6;B$:? #6;C$:? #6;D$:?
   #6;F$
GW 400 REM SHUFFLE
MR 410 LASTCD=13*SUITS
UI 420 FOR I=LASTCD TO 1 STEP -1:X=INT(I*
   RND(0))+1
HO 430 TEMCRD$=CARD$(X,X):CARD$(X,X)=CARD
   $(I,I):CARD$(I,I)=TEMCRD$:NEXT I
QN 440 REM DISPLAY CARDS
GF 450 FOR ROW=0 TO SUITS+1
WV 460 POSITION FL,ROW+6
YJ 470 FOR COL=0 TO SUITS+3
OZ 480 ? #6;CARD$((SUITS+4)*ROW+COL+1,(SU
   ITS+4)*ROW+COL+1);" ";
LR 490 NEXT COL:NEXT ROW
GB 500 FILLNU=(COL)*(ROW):REM # OF CARDS
   IN FILLED ROWS (BEFORE BOTTOM ROW)
WM 510 POSITION FL,ROW+6
DS 520 FOR K=FILLNU+1 TO LASTCD
TG 530 ? #6;CARD$(K,K);" ";
GX 540 NEXT K
JL 550 CDSBOT=LASTCD-FILLNU:REM # OF CARD
   S IN BOTTOM ROW
EC 560 FOR K=0 TO SUITS+3
RD 570 IF K<CDSBOT THEN BR(FL+2*K)=8+SUIT
   S:REM BR(COL) IS BOTTOM ROW OF COL
TX 580 IF K>=CDSBOT THEN BR(FL+2*K)=7+SUI
   TS
HH 590 NEXT K
WU 600 POKE 559,DMA:REM TURN ON SCREEN
RU 610 REM 1ST KEY
VN 620 X=USR(BAND,PEEK(SCR+12),63):IF X=4
   3 THEN GOSUB 22:IF WIN THEN 20000
DD 625 IF PEEK(764)=255 THEN POKE 77,0:GO
   TO 620:REM DISABLES ATTRACT MODE
KY 630 GET #1,KEY:OLDKEY=KEY:GOSUB 1160:A
   =KEY
SI 640 IF OLDKEY=155 THEN ER=3:GOSUB 1210
   :ER=-1:GOTO 620:REM ER IS ROW OF ERROR
LN 650 IF A>=74 AND A<=74+SUITS-1 THEN 80
   0:REM CARD TO BE MOVED IS FROM PARKING
XY 660 IF A=84 THEN GOSUB 2360:IF ER<>-1
   THEN ER=-1:GOTO 620
JO 670 IF A=84 AND MOVGRP=FALSE THEN POSI
   TION TR+2,1:? #6;"▣":MOVGRP=TRUE:GOTO
   620
```

continued on next page

```
TI 680 IF A=84 AND MOVGRP THEN POSITION T
   R+2,1:? #6;"t":MOVGRP=FALSE:GOTO 620
FR 690 IF A=27 THEN CLR :GOTO 20
XG 700 IF A=80 THEN GOSUB 1100:GOTO 620
MQ 710 IF A=32 AND MOVE<>1 THEN GOSUB 192
   0:GOTO 620:REM RESTORES PREVIOUS POSIT
   IONS.
DV 720 IF (A>=87 AND A<=90+SUITS-4) THEN
   B=A:COLB=A-87+TL:ER=2:GOSUB 1210:ER=-1
   :GOTO 620
RL 730 IF (A<65 OR A>(77+SUITS-4)) OR (A>
   =(73+SUITS-4) AND A<=73) THEN ER=3:GOS
   UB 1210:ER=-1:GOTO 620
OA 740 COLA=2*(A-65)+FL:REM COLUMN OF CAR
   D TO MOVE (FROM FIELD)
NJ 750 IF (A>=65 AND A<=72+SUITS-4) AND B
   R(COLA)=5 THEN B=A:COLB=COLA:ER=4:GOSU
   B 1210:ER=-1:GOTO 620
RF 760 ROWA=BR(COLA):REM ROW OF CARD TO M
   OVE
AN 770 COLOR A+128:PLOT COLA,4
GW 780 LOCATE COLA,ROWA,CODEA:REM CODEA I
   S ATASCII FOR CARD TO BE MOVED (FROM F
   IELD)
DQ 790 GOTO 850:REM GET 2ND KEY
ID 800 COLA=A-74+FL+2:ROWA=0:REM COLUMN A
   ND ROW OF CARD TO MOVE (FROM PARKING)
AM 810 LOCATE COLA,ROWA,CODEA
IN 820 IF (A>=74 AND A<=77+SUITS-4) AND C
   ODEA=42 THEN B=A:COLB=A-74+PL:ER=2:GOS
   UB 1210:ER=-1:GOTO 620
YE 830 COLOR A+128:PLOT COLA,2
JT 840 REM 2ND KEY
ZG 850 IF PEEK(764)=255 THEN POKE 77,0:GO
   TO 850
MS 860 GET #1,KEY:OLDKEY=KEY:GOSUB 1160:B
   =KEY
NW 870 IF OLDKEY=155 THEN ER=3:GOSUB 1210
   :ER=-1:GOTO 620
FZ 880 IF B=27 THEN CLR :GOTO 20
EY 890 IF B=80 THEN GOSUB 1100:GOTO 850
DW 900 IF B=84 AND MOVGRP THEN POSITION T
   R+2,1:? #6;"t":MOVGRP=FALSE:COLOR A+32
   :PLOT COLA,4:GOTO 620
YR 910 IF B=84 AND MOVGRP=FALSE THEN ER=1
   :COLB=TR+2:GOSUB 1210:ER=-1:GOTO 850
MZ 920 S=4-SUITS
OC 930 IF B<65 OR (B>77-S AND B<87) OR B>
   90-S OR (B>=73-S AND B<=73) THEN ER=3:
   GOSUB 1210:ER=-1:GOTO 850
DM 940 IF B=A AND (B>=65 AND B<=72-S) THE
   N COLOR A+32:PLOT COLA,4:GOTO 620
MI 950 IF B=A AND (B>=74 AND B<=74+SUITS-
   1) THEN COLOR A+32:PLOT COLA,2:GOTO 62
   0
MW 960 IF (A>=74 AND A<=77+SUITS-4) AND (
   B>=74 AND B<=77+SUITS-4) THEN COLB=B-7
   4+PL:ER=2:GOSUB 1210:ER=-1:GOTO 850
IC 970 IF MOVGRP THEN GOSUB 2380:IF ER=-1
    THEN 620
BM 980 IF MOVGRP THEN ER=-1:GOTO 850
VY 990 IF (B>=65 AND B<=72) AND A>=65 AND
    A<=72 THEN GOSUB 1300
LS 1000 IF (B>=74 AND B<=77) AND A>=65 AN
   D A<=72 THEN GOSUB 1430
QD 1010 IF (B>=87 AND B<=90) AND A>=65 AN
   D A<=72 THEN GOSUB 1550
KG 1020 IF (B>=65 AND B<=72) AND (A>=74 A
   ND A<=77) THEN GOSUB 1600
YG 1030 IF (B>=87 AND B<=90) AND (A>=74 A
   ND A<=77) THEN GOSUB 1740
GF 1040 IF ER=-1 THEN 620
EF 1050 IF ER<>-1 THEN ER=-1:GOTO 850
KJ 1060 REM MARKS POSITION
SF 1070 PLACE=PLACE+1:IF PLACE>10 THEN PL
   ACE=10:REM CAN MARK TEN PLACES ONLY
MQ 1080 MARK(PLACE)=MOVE:MARK=FALSE
BA 1090 RETURN
QX 1100 IF MARK THEN MARK=FALSE:POSITION
   FL,1:? #6;"P":RETURN
BV 1110 MARK=TRUE
JU 1120 POSITION FL,1:? #6;"P"
JP 1130 SOUND 0,100,10,12:FOR K=1 TO 100:
   NEXT K:SOUND 0,0,0,0
AN 1140 RETURN
GV 1150 REM LOWER & INV TO UPPER CASE
DV 1160 IF KEY>=128 THEN KEY=KEY-128
XN 1170 IF PEEK(702)=0 AND KEY>96 THEN KE
   Y=KEY-32
LS 1180 POKE 702,64:POKE 694,0
BC 1190 RETURN
GB 1200 REM PLOT ERRORS
OB 1210 IF ER<>3 THEN EC=COLB:BLINK$=CHR$
   (B+32)
BT 1220 IF ER=3 THEN EC=0:BLINK$=D$:REM L
   INE BETWEEN LETTERS
ZN 1230 FOR K=0 TO 6
VF 1240 POSITION EC,ER
QR 1250 IF ER=3 THEN ? #6;"
   "
QQ 1260 IF ER<>3 THEN ? #6;" "
OY 1270 FOR J=1 TO 20:NEXT J:POSITION EC,
   ER:? #6;BLINK$
LT 1280 FOR L=1 TO 20:NEXT L:NEXT K:RETUR
   N
RW 1290 REM FIELD TO FIELD
CH 1300 COLB=2*(B-65)+FL
IF 1310 LOCATE COLB,BR(COLB),CODEB
CK 1320 IF CN(CODEB)<>CN(CODEA)+1 AND BR(
   COLB)<>5 THEN ER=4:GOSUB 1210:RETURN
SR 1330 KG=CN(CODEA):IF (KG=13 OR KG=26 O
   R KG=39) AND CN(CODEB)=KG+1 THEN ER=4:
   GOSUB 1210:RETURN
ZM 1340 ROWB=BR(COLB)+1
ZR 1350 POSITION COLA,ROWA:? #6;" "
VZ 1360 COLOR CODEA:PLOT COLB,ROWB
QL 1370 BR(COLA)=BR(COLA)-1:BR(COLB)=BR(C
   OLB)+1
CF 1380 COLOR A+32:PLOT COLA,4
PS 1390 IF BR(COLA)=5 THEN BL=BL+1:REM 5
   IS THE TOP ROW OF FIELD, BL IS NUMBER
   OF BLANK (EMPTY) COLUMNS
VV 1400 IF BR(COLB)=6 THEN BL=BL-1
JA 1410 GOSUB 1840:RETURN
QS 1420 REM FIELD TO PARKING
QX 1430 COLB=B-74+PL:ROWB=0
RZ 1440 LOCATE COLB,ROWB,CODEB
CW 1450 AA=CN(CODEA):IF AA=1 OR AA=14 OR
   AA=27 OR AA=40 OR CODEB<>42 THEN ER=2:
   GOSUB 1210:RETURN
JL 1460 ST=ST-1:REM # OF EMPTY PARKING SP
   ACES
SR 1470 POSITION COLA,ROWA:? #6;" ":COLOR
    CODEA
WH 1480 COLOR CODEA:PLOT COLB,ROWB
SF 1490 BR(COLA)=BR(COLA)-1
BL 1500 COLOR A+32:PLOT COLA,4
SL 1510 IF BR(COLA)=5 THEN BL=BL+1
DD 1520 GOSUB 1840
AS 1530 RETURN
QY 1540 REM FIELD TO TERMINAL
KK 1550 COLB=B-87+TL:ROWB=0:LOCATE COLB,R
   OWB,CODEB
IX 1560 AA=CN(CODEA):IF (AA=1 OR AA=14 OR
    AA=27 OR AA=40) AND CODEB=10 THEN GOS
   UB 1470:RETURN
OK 1570 IF (CN(CODEB)<>CN(CODEA)-1) OR CO
   DEB=10 THEN ER=2:GOSUB 1210:RETURN
JN 1580 GOSUB 1470:RETURN
EH 1590 REM PARKING TO FIELD
CN 1600 COLB=2*(B-65)+FL
IL 1610 LOCATE COLB,BR(COLB),CODEB
CQ 1620 IF CN(CODEB)<>CN(CODEA)+1 AND BR(
   COLB)<>5 THEN ER=4:GOSUB 1210:RETURN
SX 1630 KG=CN(CODEA):IF (KG=13 OR KG=26 O
   R KG=39) AND CN(CODEB)=KG+1 THEN ER=4:
   GOSUB 1210:RETURN
ZS 1640 ROWB=BR(COLB)+1
DI 1650 POSITION COLA,0:? #6;"*"
WF 1660 COLOR CODEA:PLOT COLB,ROWB
RQ 1670 BR(COLB)=BR(COLB)+1
AJ 1680 COLOR A+32:PLOT COLA,2
XA 1690 IF BR(COLB)=6 THEN BL=BL-1
FP 1700 ST=ST+1
DE 1710 GOSUB 1840
AT 1720 RETURN
WG 1730 REM PARKING TO TERMINAL
VV 1740 COLB=B-87+TL:ROWB=0
SI 1750 LOCATE COLB,ROWB,CODEB
MA 1760 IF CN(CODEB)<>CN(CODEA)-1 OR CODE
   B=10 THEN ER=2:GOSUB 1210:RETURN
MD 1770 POSITION COLA,ROWA:? #6;"*"
WN 1780 COLOR CODEA:PLOT COLB,ROWB
AO 1790 COLOR A+32:PLOT COLA,2
FR 1800 ST=ST+1
DG 1810 GOSUB 1840
AV 1820 RETURN
JC 1830 REM RECORD OF MOVES
VY 1840 SOUND 0,100,10,12:M=MOVE
XK 1850 CRDREM$(M,M)=CHR$(CODEA):BEFCOL$(
   M,M)=CHR$(COLA):BEFROW$(M,M)=CHR$(ROWA
   )
HV 1860 AFTCOL$(M,M)=CHR$(COLB):AFTROW$(M
   ,M)=CHR$(ROWB)
SO 1870 FOR K=1 TO 10:NEXT K:SOUND 0,0,0,
   0
```

```
PH 1880 IF MARK THEN GOSUB 1070:POSITION
   FL,1:? #6;"P"
RW 1890 MOVE=MOVE+1:IF MOVE>300 THEN MOVE
   =300:REM CAN RECORD 300 MOVES
AR 1900 RETURN
ZA 1910 REM RESTORE PREVIOUS POSITION
HT 1920 MOVE=MOVE-1:M=MOVE:MARK=FALSE:POS
   ITION FL,1:? #6;"P"
UB 1930 BR=ASC(BEFROW$(M,M)):BC=ASC(BEFCO
   L$(M,M)):REM BR IS BEFORE ROW
PO 1940 AR=ASC(AFTROW$(M,M)):AC=ASC(AFTCO
   L$(M,M)):CR=ASC(CRDREM$(M,M))
VE 1950 IF BR>=6 AND AR>=6 THEN GOSUB 203
   0:REM FIELD TO FIELD
OY 1960 IF BR>=6 AND (AR=0 AND (AC>=PL AN
   D AC<=PR)) THEN STAR=42:GOSUB 2130
PW 1970 IF (BR=0 AND (BC>=PL AND BC<=PR))
    AND AR>=6 THEN GOSUB 2200
FR 1980 IF (BR=0 AND (BC>=PL AND BC<=PR))
    AND (AR=0 AND (AC>=TL AND AC<=TR)) TH
   EN GOSUB 2270
SB 1990 IF BR>=6 AND (AR=0 AND (AC>=TL AN
   D AC<=TR)) THEN GOSUB 2300
NH 2000 IF MARK(PLACE)=MOVE THEN GOSUB 11
   20:MARK(PLACE)=0:PLACE=PLACE-1:POSITIO
   N FL,1:? #6;"P"
AD 2010 RETURN
CD 2020 REM RESTORE FIELD TO FIELD
PW 2030 POSITION AC,AR:? #6;" "
JE 2040 COLOR CR:PLOT BC,BR
IC 2050 BR(BC)=BR(BC)+1:BR(AC)=BR(AC)-1
TV 2060 LOCATE AC,AR+1,CODECH
EK 2070 IF CODECH<>32 AND BR=6 THEN BL=BL
   -1
QI 2080 IF CODECH<>32 THEN AR=AR+1:BR=BR+
   1:CR=CODECH:GOTO 2030:REM GROUP MOVES
TD 2090 IF BR(BC)=6 THEN BL=BL-1
OY 2100 IF BR(AC)=5 THEN BL=BL+1
AF 2110 RETURN
OC 2120 REM RESTORE PARKING TO FIELD
YM 2130 COLOR STAR:PLOT AC,AR
JG 2140 COLOR CR:PLOT BC,BR
JG 2150 BR(BC)=BR(BC)+1
SW 2160 IF BR(BC)=6 THEN BL=BL-1
FZ 2170 ST=ST+1
BA 2180 RETURN
CF 2190 REM RESTORE FIELD TO PARKING
PR 2200 POSITION AC,AR:? #6;" "
IZ 2210 COLOR CR:PLOT BC,BR
JM 2220 BR(AC)=BR(AC)-1
PJ 2230 IF BR(AC)=5 THEN BL=BL+1
GO 2240 ST=ST-1
AT 2250 RETURN
AM 2260 REM RESTORE TERMINAL TO PARKING
EC 2270 COLOR ASC(UNSHUF$(CN(CR)-1,CN(CR)
   -1)):PLOT AC,AR:COLOR CR:PLOT BC,BR:ST
   =ST-1
BC 2280 RETURN
IG 2290 REM RESTORE TERMINAL TO FIELD
AV 2300 IF CN(CR)=1 OR CN(CR)=14 OR CN(CR
   )=27 OR CN(CR)=40 THEN COLOR 10:PLOT A
   C,AR:GOTO 2320
MT 2310 COLOR ASC(UNSHUF$(CN(CR)-1,CN(CR)
   -1)):PLOT AC,AR
KN 2320 BR(BC)=BR(BC)+1:IF BR(BC)=6 THEN
   BL=BL-1
JH 2330 COLOR CR:PLOT BC,BR
AS 2340 RETURN
PH 2350 REM GROUP MOVE
GY 2360 IF BL+ST<1 THEN ER=1:COLB=TR+2:B=
   116-32:GOSUB 1210
BB 2370 RETURN
OV 2380 IF B>=74 AND B<=74+SUITS-1 THEN C
   OLB=B-74+PL:ER=2:GOSUB 1210:RETURN
IV 2390 IF B>=87 AND B<=87+SUITS-1 THEN C
   OLB=B-87+TL:ER=2:GOSUB 1210:RETURN
CK 2400 COLB=2*(B-65)+FL
II 2410 LOCATE COLB,BR(COLB),CODEB
KX 2420 GOSUB 2480:REM DETERMINES NUMBER
   OF CARDS TO BE MOVED
FT 2430 IF CODEB<>32 THEN GOSUB 2640
CQ 2440 IF ER=-1 AND CODEB=32 THEN GOSUB
   2780
AN 2450 IF ER=-1 AND CODEB<>32 AND GRAPH
   THEN GOSUB 2780
BA 2460 RETURN
KC 2470 REM # OF CARDS TO MOVE
WV 2480 J=1:GRPROW=ROWA:TEMCOD=CODEA
NI 2490 LOCATE COLA,GRPROW-1,CODEG:LASTJ=
   J
LO 2500 IF CN(CODEG)=CN(TEMCOD)+1 THEN J=
   J+1:TEMCOD=CODEG:GRPROW=GRPROW-1
XU 2510 IF J=1 THEN ER=4:COLB=COLA:B=A+12
   8-32:GOSUB 1210:RETURN
NU 2520 IF CODEB<>32 AND LASTJ<J THEN 249
   0
KX 2530 IF CODEB<>32 THEN RETURN
UW 2540 IF CODEB=32 AND J=LASTJ THEN LOCA
   TE COLA,GRPROW,CODEG:LOCATE COLA,GRPRO
   W-1,CODEH:IF CODEH<>32 THEN RETURN
GV 2550 IF CODEB=32 AND CODEH=32 THEN ER=
   4:CODEH=-1:GOSUB 1210:RETURN
FQ 2560 IF BL=1 AND ST=0 THEN ER=4:GOSUB
   1210:RETURN
NQ 2570 IF BL=1 AND J<ST+1 THEN 2490
AZ 2580 IF BL=2 AND J<2+2*ST THEN 2490
ES 2590 IF BL=3 AND ST=0 AND J<4 THEN 249
   0
IP 2600 IF ((BL=3 AND ST=1) OR (BL=4 AND
   ST=0)) AND J<7 THEN 2490
LL 2610 IF ((BL>=3 AND ST>=2) OR (BL>=4 A
   ND ST>=1) OR BL>=5) AND J<12 THEN 2490
DS 2620 LASTJ=J:GOTO 2540
MS 2630 REM GROUP MOVE FOR CODEB<>32
RH 2640 LOCATE COLA,GRPROW,CODEG
QY 2650 IF CN(CODEB)<>CN(CODEG)+1 THEN ER
   =4:GOSUB 1210:RETURN
FW 2660 IF BL=0 AND J<=ST+1 THEN GRAPH=TR
   UE:RETURN
HX 2670 IF BL+ST=1 AND J=2 THEN GRAPH=TRU
   E:RETURN
SP 2680 IF ((BL=1 AND ST=1) OR (BL=2 AND
   ST=0)) AND J<=4 THEN GRAPH=TRUE:RETURN
SD 2690 IF (BL=1 AND ST=2) AND J<=6 THEN
   GRAPH=TRUE:RETURN
ZR 2700 IF ((BL=2 AND ST=1) OR (BL=3 AND
   ST=0)) AND J<=7 THEN GRAPH=TRUE:RETURN
UP 2710 IF (BL=1 AND ST=3) AND J<=8 THEN
   GRAPH=TRUE:RETURN
HO 2720 IF (BL=1 AND ST=4) AND J<=10 THEN
    GRAPH=TRUE:RETURN
HT 2730 IF (BL=2 AND ST=2) AND J<=11 THEN
    GRAPH=TRUE:RETURN
QV 2740 IF ((BL>=3 AND ST>=1) OR (BL>=4 A
   ND ST>=0)) AND J<=11 THEN GRAPH=TRUE:R
   ETURN
EO 2750 GRAPH=FALSE:ER=4:GOSUB 1210
BG 2760 RETURN
CJ 2770 REM MOVES GROUP
CY 2780 FOR L=0 TO J-1
FG 2790 POSITION COLA,GRPROW+L:? #6;" ":P
   =CN(TEMCOD):ROWB=BR(COLB)+1
GS 2800 COLOR ASC(UNSHUF$(P-L,P-L)):PLOT
   COLB,ROWB+L
GQ 2810 NEXT L
BY 2820 COLOR A+32:PLOT COLA,4
LL 2830 POSITION TR+2,1:? #6;"t"
DX 2840 BR(COLA)=BR(COLA)-J:BR(COLB)=BR(C
   OLB)+J
TE 2850 IF BR(COLA)=5 THEN BL=BL+1
HW 2860 IF CODEB=32 THEN BL=BL-1
CY 2870 ROWA=GRPROW:CODEA=CODEG:GOSUB 184
   0
WU 2880 MOVGRP=FALSE:GRAPH=FALSE
BR 2890 RETURN
ZU 20000 GRAPHICS 18:POKE 712,66:POSITION
    6,4:? #6;"WINNER":POSITION 8,5:? #6;"
   IN"
CM 20010 POSITION 6,7:? #6;MOVE;" MOVES":
   POKE 764,255
PS 20020 POKE 708,PEEK(20):X=USR(BAND,PEE
   K(20),63):SOUND 0,X,14,14
RE 20030 IF PEEK(764)=255 THEN 20020
XO 20040 POKE 764,255:SOUND 0,0,0,0:CLR :
   GOTO 20
```

LISTING 2

```
LL 10 REM BAKER SOLITAIRE
WI 20 REM BY TOM CLINE
FJ 30 REM (c) 1985,1987 ANTIC PUBLISHING
OP 35 REM (CREATES LINES 45-50)
EV 40 REM (LINES 10-250 MAY BE USED WITH
   OTHER BASIC LOADERS IN THIS ISSUE.
IJ 50 REM CHANGE LINE 70 AS NECESSARY.)
PR 60 DIM FN$(20),TEMP$(20),AR$(93):DPL=P
   EEK(10592):POKE 10592,255
WO 70 FN$="D:LINES.LST":REM THIS IS THE N
   AME OF THE DISK FILE TO BE CREATED
RD 80 ? "Disk or Cassette?";:POKE 764,25
   5
PY 90 IF  NOT (PEEK(764)=18 OR PEEK(764)=
   58) THEN 90
```

continued on next page

```
TH 100 IF PEEK(764)=18 THEN FN$="C:"
VB 110 POKE 764,255:GRAPHICS 0:? "      AN
   TIC'S GENERIC BASIC LOADER"
MY 120 ? ,"BY CHARLES JACKSON"
KB 130 POKE 10592,DPL:TRAP 200
PU 140 ? :? :? "Creating ";FN$:? "...plea
   se stand by."
LW 150 RESTORE :READ LN:LM=LN:DIM A$(LN):
   C=1
BQ 160 AR$="":READ AR$
YC 170 FOR X=1 TO LEN(AR$) STEP 3:POKE 75
   2,255
DM 180 LM=LM-1:POSITION 10,10:? "(Countdo
   wn...T-";INT(LM/10);")      "
BK 190 A$(C,C)=CHR$(VAL(AR$(X,X+2))):C=C+
   1:NEXT X:GOTO 160
MM 200 IF PEEK(195)=5 THEN ? :? :? "▶TOO
   MANY DATA LINES!":? "CANNOT CREATE FIL
   E!":END
CM 210 IF C<LN+1 THEN ? :? "▶TOO FEW DATA
    LINES!":? "CANNOT CREATE FILE!":END
UQ 220 IF FN$="C:" THEN ? :? " Prepare ca
   ssette, press [RETURN]"
AR 230 OPEN #1,8,0,FN$
PV 240 POKE 766,1:? #1;A$;:POKE 766,0
AL 250 CLOSE #1:GRAPHICS 0:? "■COMPLETED■
   "
IS 1000 DATA 156
TM 1010 DATA 0520530320660650780360610341
   04170169255133212133213104037213133213
   104037212133212202208243096
NO 1020 DATA 0340580660650780680610650680
   82040066065078036041032155053048032067
   065082068036061034065050051
LZ 1030 DATA 0520530540550560570840740810
   75097018019020021022023024025116106113
   107193178179180181182183184
HU 1040 DATA 1852122022092032251461471481
   49150151152153244234241235034058085078
   083072085070036061067065082
GI 1050 DATA 0680360580820690770320680690
   67075032079070032085078083072085070070
   076069068032067065082068083
IX 1060 DATA 155
```

ENHANCING THE NUMBER GENERATOR

RANDOM ATARI

Article on page 12

LISTING 1

Don't type the TYPO II Codes!

```
IB 10 REM RANDOM ATARI
ZV 20 REM BY DAVID McINTOSH
QH 30 REM (c)1988, ANTIC PUBLISHING
DI 100 X=12345:GOSUB 20000
BX 110 FOR I=1 TO 20:GOSUB 20200:? I,X:NE
   XT I
NU 120 END
AP 20000 REM SET UP RANDOM NUMBER GENERAT
   OR
VC 20010 DIM X$(1),X(0):X(0)=ADR(X$)+1
RY 20020 POKE 204,INT(X(0)/256):POKE 203,
   X(0)-256*INT(X(0)/256)
HR 20030 REM USER HAS PRESET X TO
WO 20040 REM EITHER 0 FOR A RANDOM SEED,
YY 20050 REM OR THE REQUIRED SEED VALUE
YJ 20060 IF X<=0 THEN X=1+INT(65536*RND(0
   ))+32768*INT(65536*RND(0)):GOTO 20060
LW 20065 IF X>2147483640 THEN X=214748364
   0
QL 20070 X(0)=INT(X):FOR X=208 TO 205 STE
   P -1:POKE X,INT(X(0)-256*INT(X(0)/256)
   ):X(0)=INT(X(0)/256):NEXT X
YE 20080 X(0)=ADR("hh┐Uh┐Th┐Wh┐VhhC◢1TcU◢
   ✱y●")
ZR 20090 X=ADR("█ ▶♥▀◢▬◆JP♠▀◢▬6◆JP♠▀┤▬6ZJ
   P♠✱✱ 1◢▀┤✱r5◆i♥▬◆JPU◢PI●▬▀┤5duT▬dJPW●▶
   ♥┐◆◢e▀┐6▁JP♠Fe▀┤9d♥y◆♥")
OA 20100 X=USR(X(0),X,1536,85)
WJ 20120 X=ADR("▯d♥◢Pt◢◆i♥┐d◢e&dFe◢dP▬eh┐
   h█▀▶♥yd♥▯d♥◢PU▶♥P▁●█♥▶?rK▶♥HrK T◢ ^◢◢d
   PH█HP! T◢ ^◢◢dPH█HP→█♥")
KA 20130 X=USR(X(0),X,1621,85)
OI 20140 X=ADR("1K✱J◣rKPY T◢ ^◢◢d◣◣◣◣rK T
   ◢ ^◢1K▬edrKHe◢P◆●▀┤5d▬TJPy●▶♥┐d q◢ q◢
   1◢◢di♥┐d▬▀┐6CJP♠●")
IW 20150 X=USR(X(0),X,1706,80)
DZ 20160 RETURN
ZU 20200 REM GET NEXT RANDOM NUMBER
WF 20210 X=USR(ADR("h▶▬┐C▶,┐◣▶Z┐1▶(┐^▀┤5L
   ▬TJPy ♥◢ >◢▀┤5d▬LJPy q◢ h◢●")):X=X(0):
   RETURN
```

LISTING 2

```
BW 10 REM RANDOM ATARI, LISTING 2
ZV 20 REM BY DAVID McINTOSH
FJ 30 REM (c) 1985,1987 ANTIC PUBLISHING
GC 35 REM CREATES LINES 20080-20090, 2012
   0, 20140 AND 20210 FOR RANDOM.BAS
EV 40 REM (LINES 10-250 MAY BE USED WITH
   OTHER BASIC LOADERS IN THIS ISSUE.
IJ 50 REM CHANGE LINE 70 AS NECESSARY.)
PR 60 DIM FN$(20),TEMP$(20),AR$(93):DPL=P
   EEK(10592):POKE 10592,255
WO 70 FN$="D:LINES.LST":REM THIS IS THE N
   AME OF THE DISK FILE TO BE CREATED
RD 80 ? "▶Disk or Cassette?";:POKE 764,25
   5
PY 90 IF  NOT (PEEK(764)=18 OR PEEK(764)=
   58) THEN 90
TH 100 IF PEEK(764)=18 THEN FN$="C:"
VB 110 POKE 764,255:GRAPHICS 0:? "      AN
   TIC'S GENERIC BASIC LOADER"
MY 120 ? ,"BY CHARLES JACKSON"
KB 130 POKE 10592,DPL:TRAP 200
PU 140 ? :? :? "Creating ";FN$:? "...plea
   se stand by."
LW 150 RESTORE :READ LN:LM=LN:DIM A$(LN):
   C=1
BQ 160 AR$="":READ AR$
YC 170 FOR X=1 TO LEN(AR$) STEP 3:POKE 75
   2,255
DM 180 LM=LM-1:POSITION 10,10:? "(Countdo
   wn...T-";INT(LM/10);")      "
BK 190 A$(C,C)=CHR$(VAL(AR$(X,X+2))):C=C+
   1:NEXT X:GOTO 160
MM 200 IF PEEK(195)=5 THEN ? :? :? "▶TOO
   MANY DATA LINES!":? "CANNOT CREATE FIL
   E!":END
CM 210 IF C<LN+1 THEN ? :? "▶TOO FEW DATA
    LINES!":? "CANNOT CREATE FILE!":END
UQ 220 IF FN$="C:" THEN ? :? " Prepare ca
   ssette, press [RETURN]"
AR 230 OPEN #1,8,0,FN$
PV 240 POKE 766,1:? #1;A$;:POKE 766,0
AL 250 CLOSE #1:GRAPHICS 0:? "■COMPLETED■
   "
IP 1000 DATA 426
DC 1010 DATA 0500480480560480320880400480
   41061065068082040034104104133213104133
   212104133215104133214104104
XU 1020 DATA 1681361772121452141360162490
   96034041155050048048057048032088061065
   068082040034160032169000162
QI 1030 DATA 0081492242022082511620080240
   54224202208251162004024054218202208251
   144016032049006162004144009
YG 1040 DATA 1812241050001492242022082451
   36208219096024162004181228117212149228
   202208247096169000133224006
PS 1050 DATA 2291620050542232022082510702
   29160004185228000121224000034041155050
   048049050048032088061065068
FL 1060 DATA 0820400341532280001362082441
   65224105000133228006229038228070229165
   228240021101232133232160003
SK 1070 DATA 16900012122280001532280001362
   08245169000240223096160000169063145203
   169000200145203032212006032
```

```
JB 1080 DATA 222006165228240000416000120803303221200603222200616522824000041600012080311600000340411550500 48
```

```
JB 1080 DATA 2220061652282400004160001208033032212006032222006165228240000416000120803116000003404115505004 8
```

LISTING 3

```
10 ;RANDOM ATARI, SOURCE CODE
20 ;BY DAVID McINTOSH
30 ;(c)1988, ANTIC PUBLISHING
40         *=  $6400
50         PLA
60         LDA #23
70         STA 219
80         LDA #172
90         STA 220
0100       LDA #218
0110       STA 221
0120       LDA #126
0130       STA 222
0140       LDX #4
0150 RND1
0155       LDA 204,X
0160       STA 212,X
0170       DEX
0180       BNE RND1
0185 ;
0190       JSR MULT
0200       JSR MOD231M1
0210       LDX #4
0220 RND2
0225       LDA 228,X
0230       STA 204,X
0240       DEX
0250       BNE RND2
0255 ;
0260       JSR ROTATL
0270       JSR BTOD
0280       RTS
0285 ;
0290       *=  1536
0300 ;MULTIPLY FR0 BY FRE GIVING FR1
0310 MULT
0315       LDY #32
0320       LDA #0
0330       LDX #8
0340 ML1
0345       STA 224,X
0350       DEX
0360       BNE ML1
0365 ;
0370 ML2
0375       LDX #8
0380       CLC
0390 R1
0395       ROL 224,X
0400       DEX
0410       BNE R1
0415 ;
0420       LDX #4
0430       CLC
0440 R2
0445       ROL 218,X
0450       DEX
0460       BNE R2
0465 ;
0470       BCC ML3
0475 ;
0480       JSR ADDER
0490       LDX #4
0500 MLA
0505       BCC ML3
0507 ;
0510       LDA 224,X
0520       ADC #0
0530       STA 224,X
0540       DEX
0550       BNE MLA
0555 ;
0560 ML3
0565       DEY
0570       BNE ML2
0575 ;
0580       RTS
0585 ;
0590 ;ADD FR0 TO FR1
0600 ADDER
0605       CLC
0610       LDX #4
0620 ADDR1
0625       LDA 228,X
0630       ADC 212,X
0640       STA 228,X
0650       DEX
0660       BNE ADDR1
0665 ;
0670       RTS
0675 ;
0680 ;CONVERT 8 BYTES AT FR1
0685 ;TO MOD 2^31-1
0690 MOD231M1
0695       LDA #0
0700       STA 224
0710       ASL 229
0720       LDX #5
0730 MOD1
0735       ROL 223,X
0740       DEX
0750       BNE MOD1
0755 ;
0760       LSR 229
0770       LDY #4
0780 MOD2
0785       LDA 228,Y
0790       ADC 224,Y
0800       STA 228,Y
0810       DEY
0820       BNE MOD2
0825 ;
0830       LDA 224
0840       ADC #0
0850 MOD3
0855       STA 228
0860       ASL 229
0870       ROL 228
0880       LSR 229
0890       LDA 228
0900       BEQ MOD5
0905 ;
0910       ADC 232
0920       STA 232
0930       LDY #3
0940 MOD4
0945       LDA #0
0950       ADC 228,Y
0960       STA 228,Y
0970       DEY
0980       BNE MOD4
0985 ;
0990       LDA #0
1000       BEQ MOD3
1005 ;
1010 MOD5
1015       RTS
1017 ;
1020 ;CONVERT BINARY TO DECIMAL
1030 BTOD
1035       LDY #0
1040       LDA #63
1050       STA (203),Y
1060       LDA #0
1070       INY
1080       STA (203),Y
1090 BD1
1095       JSR MOVE
1100       JSR MUL10
1110       LDA 228
1120       BEQ BD2
1125 ;
1130       LDY #1
1140       BNE BD6
1145 ;
1150 BD2
1155       JSR MOVE
1160       JSR MUL10
1170       LDA 228
```

continued on next page

```
1180        BEQ BD4
1185 ;
1190        LDY #1
1200        BNE BD8
1205 ;
1210 BD4
1215        LDY #0
1220        LDA (203),Y
1230        TAX
1240        DEX
1250        TXA
1260        STA (203),Y
1270        BNE BD1
1275 ;
1280 BD5
1285        JSR MOVE
1290        JSR MUL10
1300        LDA 228
1310 BD6
1315        ASL A
1320        ASL A
1330        ASL A
1340        ASL A
1350        STA (203),Y
1360        JSR MOVE
1370        JSR MUL10
1380 BD8
1385        LDA (203),Y
1390        CLC
1400        ADC 228
1410        STA (203),Y
1420        INY
1430        CPY #6
1440        BNE BD5
1445 ;
1450        RTS
```

```
1455 ;
1460 ;MOVE FR1 TO FR0
1470 MOVE
1475        LDX #4
1480 MV1
1485        LDA 228,X
1490        STA 212,X
1500        DEX
1510        BNE MV1
1515 ;
1520        RTS
1525 ;
1530 ;MULTIPLY FR0 BY 10 GIVING FR1
1540 ;ASSUMED:  FR0 = FR1
1550 MUL10
1555        LDA #0
1560        STA 228
1570        JSR ROTATL
1580        JSR ROTATL
1590        JSR ADDER
1600        LDA 228
1610        ADC #0
1620        STA 228
1630 ;FALL THROUGH TO ROTATL
1640 ;ROTATE LEFT,
1645 ;FROM 227+1 TO 227+5
1650 ROTATL
1655        CLC
1660        LDX #5
1670 ROTL
1675        ROL 227,X
1680        DEX
1690        BNE ROTL
1695 ;
1700        RTS
```

FLASHY ELECTRONIC BILLBOARDS WITH YOUR ATARI

SIGNMAKER

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LISTING 1

Don't type the TYPO II Codes!

```
CU 10 REM SIGNBOARD
BH 12 REM BY ANDREW R. THOMAS
QN 14 REM (c)1988, ANTIC PUBLISHING
JD 16 GOTO 12500
WB 100 REM CLICK
ZI 110 FOR IT=C1 TO C4:SOUND C0,110-IT,10
   ,C2:NEXT IT
CM 115 SOUND C0,C0,C0,C0
ZB 120 RETURN
FW 140 REM READ LOOP
EJ 145 TEMP$=""
ZI 150 FOR IT=C1 TO VAR:READ VAR1:TEMP$(I
   T,IT)=CHR$(VAR1):NEXT IT
ZW 155 RETURN
PB 160 REM INSUFFICIENT MEMORY
GS 165 TC=C0:TR=C0:GOSUB BPOS:? " Insuffi
   cient Memory";
KZ 170 GOSUB PAUSE
VT 175 GOSUB BPOS
ZN 180 RETURN
ZW 185 REM GET INSTRUCTION
NZ 190 TRAP 195:VAR=ASC(S$(SP,SP)):VAR1=V
   AR-47:SP=SP+C1
VH 195 TRAP 40000:RETURN
WK 200 REM D/L INFO
YP 205 VAR=DL+ROW*3:VAR1=PEEK(VAR-C1):VAR
   2=PEEK(VAR)
ZA 210 RETURN
RZ 220 REM HI/LO
WF 225 HI=INT(VAR/C256):LO=VAR-256*HI
ZE 230 RETURN
JT 250 REM INSERT STEPS
WP 255 VAR=LEN(S$):IF SP>VAR THEN RETURN
GI 260 VAR1=VAR-SP+C1
MY 265 S$(VAR+SH,VAR+SH)=" "
QG 270 IF VAR1<255 THEN 290
PP 275 VAR1=VAR1-255:DUM=USR(ADR(PPMOVE$)
   ,ADR(S$(SP+VAR1,SP+VAR1))-C1,ADR(S$(SP
   +VAR1,SP+VAR1))-C1+SH,255)
ZE 280 IF VAR1=0 THEN RETURN
PV 285 GOTO 270
UM 290 DUM=USR(ADR(PPMOVE$),ADR(S$(SP,SP)
   )-C1,ADR(S$(SP,SP))-C1+SH,VAR1)
AF 295 RETURN
YO 300 REM Y/N ?
EA 305 ITEM=C1
KD 310 TC=C0:TR=C0:GOSUB BPOS:? QMENU$;
JT 315 IDIS=C5:I$=QMI$:GOSUB MENUSEL
RC 320 TC=C0:TR=C2:GOSUB BPOS
ZS 325 RETURN
QZ 330 REM SINGLE POINTER
WF 335 GOSUB 750
WX 340 IF VAR2=28 OR VAR2=12 THEN RETURN
QO 345 GOTO 335
VD 350 REM CHAR EQUIVS
RL 351 TC=C0:TR=C2:GOSUB BPOS
NN 352 ? "CTR ";:FOR IT=C1 TO 26:? CHR$(I
   T+64);:NEXT IT:FOR IT=28 TO 31:? CHR$(
   27);CHR$(IT);:NEXT IT
JB 353 ? ".; ■■";
JR 354 TC=C4:TR=C3:GOSUB TPOS
CN 355 IF PEEK(DCASE)=LC THEN 358
PR 356 FOR IT=33 TO 58:? CHR$(IT);:NEXT I
   T:FOR IT=60 TO 64:? CHR$(IT);:NEXT IT:
   ? "[ ;";
AE 357 RETURN
JG 358 FOR IT=C1 TO 26:? CHR$(IT);:NEXT I
   T:FOR IT=28 TO 31:? CHR$(27);CHR$(IT);
   :NEXT IT
VH 359 ? "■■ ■■";
ZL 360 RETURN
XR 370 REM ONSCREEN WRITING
UJ 371 GOSUB 350
DM 372 OPEN #1,C4,0,"K:":POKE 764,255
VW 373 VAR4=(PEEK(DCASE)=UC)*-8+19
WZ 375 GOSUB 760
WL 376 POKE 764,VAR2
OW 377 GET #1,VAR3
MI 378 IF VAR3=27 THEN GET #1,VAR3
NG 380 IF VAR3=27 THEN CLOSE #1:? "■";:RE
   TURN
ZR 381 IF VAR3<>155 THEN 384
```

```
KW 382 IF ROW<9 THEN ROW=ROW+C1:COL=0
RK 383 GOTO 373
YU 384 TEXT$="":TEXT$=CHR$(VAR3)
TY 385 DUM=USR(ADR(TRANS$),ADR(TEXT$)-C1,
   ADR(TEXT$)-C1,C1)
AL 386 VAR3=ASC(TEXT$(C1,C1))
UY 388 GOSUB DLI:VAR1=VAR2*C256+VAR1+COL
MC 390 POKE VAR1,VAR3
EZ 392 SH=C5:IF SP+SH>SL THEN GOSUB IMEM:
   RETURN
UA 394 GOSUB IS
WL 396 S$(SP,SP+C1)="03":S$(SP+C2,SP+C2)=
   CHR$(ROW):S$(SP+C3,SP+C3)=CHR$(COL):S$
   (SP+C4,SP+C4)=CHR$(VAR3)
YS 398 SP=SP+SH
UB 400 IF COL<19 THEN COL=COL+C1
QS 402 GOTO 373
IK 410 REM RESET
SI 411 GOSUB 1350:POKE DCASE,UC
UX 412 POKE 203,40:POKE 204,202:POKE 205,
   148:POKE 206,70:POKE 207,0:POKE 208,C0
   :POKE 708,40:POKE 711,70
SX 413 POKE 712,0:RETURN
WF 500 REM WINDOW POS
QS 510 POKE 656,TR:POKE 657,TC
ZF 520 RETURN
GE 530 REM PAUSE
II 535 TC=C0:TR=C3:GOSUB TPOS
WT 540 POKE 764,255
IM 545 ? "        press any key to continu
   e  ";
HK 550 IF PEEK(764)=255 THEN 550
XK 555 POKE 764,255
IZ 560 TC=C0:TR=C3:GOSUB TPOS:? BLANK$(C1
   ,38);
AC 565 RETURN
IH 580 REM TEXT WINDOW POS & BLANK
KA 585 GOSUB TPOS:? BLANK$;:GOSUB TPOS
ZT 590 RETURN
KC 600 REM MENU SELECT
XB 605 POKE 764,255
UT 610 TC=ITEM*IDIS:TR=C0:GOSUB TPOS:? "
   ";
DG 620 IF PEEK(764)<255 THEN 700
PF 625 IF STICK(C0)<15 THEN 640
WY 630 IF  NOT STRIG(C0) THEN 740
PA 635 GOTO 620
BI 640 IF STICK(C0)<>7 THEN 660
OP 645 IF ITEM<LEN(I$)-C1 THEN ITEM=ITEM+
   C1
IS 650 GOSUB TPOS:? " ";
TP 655 GOTO 675
YP 660 IF STICK(C0)<>11 THEN 620
IR 665 IF ITEM>C0 THEN ITEM=ITEM-C1
IW 670 GOSUB TPOS:? " ";
LJ 675 TC=ITEM*IDIS:GOSUB TPOS:? "  ";
CS 680 GOSUB CLICK:GOTO 620
NL 700 VAR=PEEK(764):POKE 764,255
RL 702 IF VAR=7 OR VAR=135 THEN 645
SP 703 IF VAR=6 OR VAR=134 THEN 665
ZO 704 GOSUB CLICK
VG 707 IF VAR=12 THEN 740
LV 710 IF VAR=28 THEN ITEM=-1:RETURN
WG 715 IF I$(C1,C1)="!" THEN 740
AM 716 IT=C1
YW 720 IF I$(IT,IT)=CHR$(VAR) THEN 735
BI 725 IF IT=LEN(I$) THEN 620
VD 730 IT=IT+C1:GOTO 720
GE 735 ITEM=IT-C1:GOSUB TPOS:? " ";:TC=IT
   EM*IDIS:GOSUB TPOS:? "  ";
XB 740 IF  NOT STRIG(C0) THEN 740
AA 745 RETURN
RQ 750 REM PTR
XM 755 POKE 764,255
SR 760 GOSUB DLI:VAR1=VAR2*C256+VAR1+COL:
   VAR2=255:VAR3=15
QU 765 OLDCHAR$=CHR$(PEEK(VAR1))
MU 770 POKE VAR1,VAR4
PB 775 IF PEEK(764)<255 THEN VAR2=PEEK(76
   4):POKE 764,255:GOTO 790
HQ 780 IF STICK(C0)<15 THEN VAR3=STICK(0)
   :GOTO 800
NE 785 IF  NOT STRIG(C0) THEN VAR2=12:GOT
   O 870
UJ 786 GOTO 775
AN 790 IF VAR2=28 THEN VAR4=-C1:GOTO 870
UL 795 IF VAR2=12 THEN 870
AG 800 OLDROW=ROW:OLDCOL=COL
ZG 801 GOSUB CLICK
UW 805 IF (VAR2=6 OR VAR3=11) AND COL>C0
   THEN COL=COL-C1:GOTO 850
CI 810 IF (VAR2=7 OR VAR3=7) AND COL<19 T
   HEN COL=COL+C1:GOTO 850
JG 815 IF (VAR2=14 OR VAR3=14) AND ROW>C0
    THEN ROW=ROW-C1:GOTO 850
JZ 820 IF (VAR2=15 OR VAR3=13) AND ROW<9
   THEN ROW=ROW+C1:GOTO 850
XU 825 IF VAR3=10 AND (COL>C0 AND ROW>C0)
    THEN COL=COL-C1:ROW=ROW-C1:GOTO 850
VF 830 IF VAR3=6 AND (COL<19 AND ROW>C0)
   THEN COL=COL+C1:ROW=ROW-C1:GOTO 850
NA 835 IF VAR3=9 AND (COL>C0 AND ROW<9) T
   HEN COL=COL-C1:ROW=ROW+C1:GOTO 850
WY 840 IF VAR3=5 AND (COL<19 AND ROW<9) T
   HEN COL=COL+C1:ROW=ROW+C1:GOTO 850
KG 845 IF  NOT (VAR3<15 OR VAR2=6 OR VAR2
   =7 OR VAR2=14 OR VAR2=15) THEN 870
OV 850 POKE VAR1,ASC(OLDCHAR$(C1,C1))
RK 865 GOTO 760
OZ 870 POKE VAR1,ASC(OLDCHAR$(C1,C1))
AH 875 RETURN
IA 900 REM MAIN MENU
DV 905 ITEM=C0
QC 910 TC=C0:TR=C0:GOSUB BPOS
FY 915 ? " Play  Rec   Edit  Load  Save
   New   Q";
HL 920 IDIS=C6:I$=MMI$:GOSUB MENUSEL
IY 925 IF ITEM=-C1 THEN ITEM=C0:GOTO 920
MI 930 ON ITEM+C1 GOSUB 1000,950,10000,13
   000,13200,13400,30000
PW 935 GOTO 910
QJ 950 REM RECORD
EF 955 ITEM=C0
QM 960 TC=C0:TR=C0:GOSUB BPOS
DE 965 ? " Write   Scroll  Pause   Option
     Load"
DW 970 IDIS=8:I$=RMI$:GOSUB MENUSEL
ZV 975 IF ITEM=-C1 THEN ITEM=C0:RETURN
RE 980 ON ITEM+C1 GOSUB 4000,5000,4700,80
   00,9000
SL 995 GOTO 960
AJ 1000 REM PLAY
UD 1001 IF  NOT LEN(S$) THEN RETURN
GL 1005 POKE 764,255
JN 1010 SP=C1:FLAG=C0:POKE 559,0
GB 1015 POKE DL+29,65:POKE DL+30,210:POKE
    DL+31,6
YC 1020 GOSUB RESET:POKE 559,34
ES 1025 GOSUB 1050:POKE 77,C0
QH 1030 IF SP<LEN(S$) THEN 1025
WO 1035 FOR IT=C1 TO 100:NEXT IT
QD 1040 IF PEEK(764)=255 THEN 1010
JI 1044 POKE 559,0:POKE DL+29,66:POKE DL+
   30,PEEK(660):POKE DL+31,PEEK(661):POKE
    559,34
VS 1045 POKE 764,255:SP=LEN(S$)+C1:RETURN
SH 1050 REM PLAY 1 INSTRUCTION
SE 1060 GOSUB GI
ZP 1070 ON VAR1 GOSUB 1100,2000,1400,3000
   ,3100:RETURN
RO 1100 GOSUB GI
TE 1110 ON VAR1 GOSUB 1150,1200,1300,1500
   :RETURN
CP 1150 TEMP$="ENTER  "
AS 1155 TEXT$=" ":GOSUB GI:TEXT$(VAR,VAR)
   =" "
NY 1160 DUM=USR(ADR(PPMOVE$),ADR(S$(SP,SP
   ))-C1,ADR(TEXT$)-C1,VAR)
JQ 1165 VAR1=(VAR<25)*VAR+(VAR>=25)*25
FC 1170 TEMP$(8)=TEXT$(1,VAR1):TEMP$(8+VA
   R1)="  ..."
EJ 1175 FOR IT=C1 TO C2:DUM=USR(ADR(TRANS
   $),ADR(TEMP$(8))-C1,ADR(TEMP$(8))-C1,V
   AR1):NEXT IT
TH 1190 SP=SP+VAR
BW 1195 RETURN
AR 1200 REM PLACE
JL 1205 GOSUB GI:VAR2=VAR1
HC 1210 GOSUB GI:ROW=VAR
GK 1211 TEMP$="PLACE LINE "
PZ 1212 TEMP$(12)=STR$(ROW)
HN 1215 ON VAR2 GOSUB 1220,1240,1270:RETU
   RN
AU 1220 GOSUB DLI:TEMP$(13)=" LEFT OFFSCR
   EEN"
PF 1225 IF VAR1<LEN(TEXT$) THEN RETURN
JW 1230 DUM=USR(ADR(PPMOVE$),ADR(TEXT$)-C
   1,VAR2*256+VAR1-LEN(TEXT$)-C1,LEN(TEXT
   $))
BG 1235 RETURN
IE 1240 TEMP$(13)=" ONSCREEN"
RT 1241 GOSUB GI:COL=VAR
GH 1245 GOSUB DLI
```

continued on next page

```
SQ 1250 IF VAR1+COL+LEN(TEXT$)>255 THEN R
   ETURN
DU 1255 DUM=USR(ADR(PPMOVE$),ADR(TEXT$)-1
   ,VAR2*256+VAR1+COL-C1,LEN(TEXT$))
AV 1260 RETURN
UO 1270 GOSUB DLI:TEMP$(13)=" RIGHT OFFSC
   REEN"
MH 1275 IF VAR1+19+LEN(TEXT$)>255 THEN RE
   TURN
UE 1280 DUM=USR(ADR(PPMOVE$),ADR(TEXT$)-C
   1,VAR2*256+VAR1+19,LEN(TEXT$))
BV 1285 RETURN
DP 1300 REM CLEAR
NU 1305 GOSUB GI:TEMP$="CLEAR "
IF 1310 ON VAR1 GOSUB 1360,1320,1350:RETU
   RN
HH 1320 GOSUB GI:ROW=VAR
QT 1321 TEMP$(C7)="LINE  ":TEMP$(12)=STR$(
   ROW)
GD 1325 GOSUB DLI
JF 1330 DUM=USR(ADR(PCLEAR$),VAR2)
BI 1335 RETURN
XV 1350 FOR ROW=C0 TO 9:GOSUB DLI:DUM=USR
   (ADR(PCLEAR$),VAR2):POKE VAR-C1,117:NE
   XT ROW:ROW=C0
LX 1355 TEMP$(C7)="DISPLAY"
BS 1356 RETURN
KP 1360 GOSUB GI:ROW=VAR:GOSUB GI:COL=VAR

GP 1365 GOSUB DLI
WK 1370 POKE VAR2*256+VAR1+COL,C0
QA 1375 TEMP$(C7)="CHAR LINE     COL ":TEM
   P$(17,17)=STR$(ROW):TEMP$(24)=STR$(COL
   )
BD 1380 RETURN
AD 1400 TEMP$="PAUSE "
OQ 1405 GOSUB GI:TEMP$(C7)=STR$(VAR-C1):I
   F FLAG THEN RETURN
IF 1410 VAR1=INT((VAR+C1)/C2):POKE 20,128
   *(C2*VAR1-VAR):POKE 19,255-VAR1
GG 1415 IF PEEK(19) THEN 1415
AN 1420 RETURN
AC 1500 TEMP$="ONSCREEN WRITING"
MM 1505 ROW=ASC(S$(SP,SP)):COL=ASC(S$(SP+
   C1,SP+C1)):VAR1=ASC(S$(SP+C2,SP+C2)):S
   P=SP+C3
DK 1510 VAR=DL+ROW*3:POKE PEEK(VAR)*256+P
   EEK(VAR-C1)+COL,VAR1
BG 1515 RETURN
SG 2000 GOSUB GI:TEMP$="SCROLL "
YM 2020 ON VAR1 GOSUB 2050,2300:RETURN
HV 2050 TEMP$(8)="LINE "
JG 2060 GOSUB GI:VAR2=VAR1
CO 2065 GOSUB GI:ROW=VAR:TEMP$(13)=STR$(R
   OW)
CM 2070 GOSUB GI:DIR=VAR-C1:GOSUB GI:DIST
   =VAR:GOSUB GI:SPEED=VAR
VW 2075 ON VAR2 GOSUB 2100,2200:RETURN
YN 2100 IF DIR=-C1 THEN TEMP$(14)=" LEFT"
   :GOTO 2110
RT 2105 TEMP$(14)=" RIGHT"
RT 2110 VAR=DL+ROW*C3:VAR1=PEEK(VAR-C1):V
   AR2=PEEK(VAR)
OI 2120 FOR IT=C1 TO DIST
ZL 2130 VAR1=PEEK(VAR-C1)-DIR
GU 2135 IF VAR1>-C1 AND VAR1<C256 THEN PO
   KE VAR-C1,VAR1
CQ 2140 FOR IT1=C1 TO 60 STEP SPEED+C1:NE
   XT IT1
SB 2150 NEXT IT
AU 2160 RETURN
ZC 2200 REM U/D
BC 2205 IF DIR=-C1 THEN TEMP$(14)=" UP":G
   OTO 2210
FD 2206 TEMP$(14)=" DOWN"
VG 2210 IT=C1
VC 2220 VAR=DL+ROW*3:VAR1=PEEK(VAR-1):VAR
   2=PEEK(VAR)
VV 2225 IF (ROW=C0 AND DIR=-C1) OR (ROW=9
    AND DIR=C1) THEN 2270
BQ 2230 VAR3=VAR+3*DIR
FX 2231 DUM=USR(ADR(PCLEAR$),PEEK(VAR3))
MH 2235 POKE VAR,PEEK(VAR3):POKE VAR3-C1,
   VAR1:POKE VAR3,VAR2:POKE VAR-C1,117
CS 2240 FOR IT1=C1 TO 60 STEP SPEED+C1:NE
   XT IT1
FZ 2245 ROW=ROW+DIR
NY 2250 IT=IT+C1:IF IT<=DIST THEN 2220
AW 2260 RETURN
TC 2270 DUM=USR(ADR(PCLEAR$),VAR2):POKE V
   AR-C1,117:RETURN
YC 2300 TEMP$(8)="DISPLAY "
JO 2305 GOSUB GI:VAR2=VAR1
CA 2310 GOSUB GI:DIR=VAR-C1:GOSUB GI:DIST
   =VAR:GOSUB GI:SPEED=VAR
EG 2315 ON VAR2 GOSUB 2350,2500:RETURN
VQ 2350 IF DIR=-C1 THEN TEMP$(16)="LEFT":
   GOTO 2360
JY 2355 TEMP$(16)="RIGHT"
OM 2360 SCRH$(C4,C4)=CHR$(238-16*DIR)
PS 2365 FOR IT=C1 TO DIST
PW 2370 DUM=USR(ADR(SCRH$))
DG 2385 FOR IT1=C1 TO 50 STEP SPEED+C1:NE
   XT IT1
OR 2390 NEXT IT:RETURN
LX 2500 VAR=(C3-DIR)/C2:IF DIR=-C1 THEN T
   EMP$(16)="UP":GOTO 2510
EH 2505 TEMP$(16)="DOWN"
ON 2510 FOR IT=C1 TO DIST
ZI 2515 ON VAR GOTO 2520,2530
IU 2520 VAR1=PEEK(DL+27):DUM=USR(ADR(PCLE
   AR$),VAR1):DUM=USR(ADR(SCRD$)):POKE DL
   ,VAR1:POKE DL-C1,117:GOTO 2540
KH 2530 VAR1=PEEK(DL):DUM=USR(ADR(PCLEAR$
   ),VAR1):DUM=USR(ADR(SCRU$)):POKE DL+27
   ,VAR1:POKE DL+26,117
DS 2540 FOR IT1=C1 TO 70 STEP SPEED+C1:NE
   XT IT1
TA 2545 NEXT IT
AZ 2550 RETURN
MB 3000 REM OPTION
KL 3010 GOSUB GI:ON VAR1 GOSUB 3050,3070,
   3130,3150
AY 3015 RETURN
DE 3050 TEMP$="SHIFT"
EV 3055 GOSUB GI:POKE DCASE,VAR:RETURN
CP 3070 TEMP$="COLOR "
LM 3075 GOSUB GI:CASE=VAR:GOSUB GI
PQ 3080 VAR2=C2+CASE*C7:TEMP$(C7,12)=CASE
   MENU$(VAR2,VAR2+C5):VAR2=INT(VAR/16)
PS 3090 TEMP$(13,15)="   ":TEMP$(14)=STR$
   (VAR2):TEMP$(16)=" ":TEMP$(17)=STR$((V
   AR-VAR2*16)/C2+C1)
BS 3095 POKE 203+CASE,VAR:POKE 708+CASE,V
   AR:RETURN
JK 3100 TEMP$="LOAD "
EL 3105 GOSUB GI:FILE$=S$(SP,SP+VAR-C1):T
   EMP$(C6,C5+VAR)=FILE$:SP=SP+VAR
XP 3110 IF FLAG OR PEEK(764)<255 THEN RET
   URN
EC 3120 GOSUB 13040
BD 3125 RETURN
TE 3130 TEMP$="BLINK "
RP 3135 GOSUB GI:CASE=VAR:GOSUB GI:POKE 1
   721,VAR:POKE 208,CASE:IF  NOT CASE THE
   N TEMP$(7)="OFF":RETURN
PD 3140 VAR2=C2+(CASE-C1)*C7:TEMP$(7)=CASE
   MENU$(VAR,VAR+C6):RETURN
VZ 3150 REM MISC
VX 3155 GOSUB GI:ON VAR1 GOSUB 3200
AV 3160 RETURN
BH 3200 TEMP$="FADE "
ZD 3205 GOSUB GI:DIR=VAR-1:GOSUB GI:CASE=
   VAR:GOSUB GI:SPEED=VAR+1
TR 3210 IF DIR-C1 THEN TEMP$(6)="OUT ":GO
   TO 3220
BW 3215 TEMP$(6)="IN  "
EY 3220 VAR2=C2+CASE*C7:TEMP$(10)=CASEMEN
   U$(VAR2,VAR2+C5):VAR4=203+CASE
HQ 3225 VAR3=PEEK(VAR4):COLVAR=INT(VAR3/1
   6)
VK 3230 VAR2=VAR3-COLVAR*16:IF (VAR2<C2 A
   ND DIR=-C1) OR (VAR2>13 AND DIR=C1) TH
   EN RETURN
ST 3235 VAR3=VAR3+DIR*C2:POKE VAR4,VAR3:P
   OKE 708+CASE,VAR3
JD 3240 FOR IT=C1 TO 30 STEP SPEED:NEXT I
   T:GOTO 3225
SB 4000 REM WRITE
EF 4010 ITEM=C0
ES 4020 TC=C0:TR=C0:GOSUB BPOS
VC 4030 ? " Enter   Place   Clear   Onscr
   een"
LE 4040 IDIS=8:I$=WMI$:GOSUB MENUSEL
JW 4050 IF ITEM=-C1 THEN ITEM=C0:RETURN
OD 4060 ON ITEM+C1 GOSUB 4100,4200,4400,3
   70
PT 4070 GOTO 4020
BX 4100 REM W_TEXT
SS 4110 ? CHR$(125);
GB 4115 TC=C0:TR=C1:GOSUB BPOS
IA 4116 ? "  2 4 6 8 0 2 4 6 8 0";
YN 4120 GOSUB 350
FO 4125 TC=C0:TR=C0:GOSUB BPOS
PC 4126 POKE 752,C0:INPUT TEMP$:POKE 752,
   C1
```

```
XL 4130 IF LEN(TEMP$)=C0 THEN ? CHR$(125)
   ;:RETURN
KA 4135 TEXT$=TEMP$:ITEM=C1
VJ 4140 DUM=USR(ADR(TRANS$),ADR(TEXT$)-1,
   ADR(TEXT$)-C1,LEN(TEMP$))
GP 4150 ? CHR$(125)
YO 4155 VAR2=LEN(TEXT$)
PP 4160 SH=VAR2+C3:IF SP+SH>SL THEN GOSUB
    IMEM:RETURN
ZB 4165 GOSUB IS
MQ 4170 S$(SP,SP+C1)="00":S$(SP+C2,SP+C2)
   =CHR$(VAR2)
XP 4175 S$(SP+C3,SP+C3+VAR2-C1)=TEXT$:SP=
   SP+SH
BC 4180 RETURN
XX 4200 REM W_PLACE
FM 4205 ITEM=C1
FE 4210 TC=C0:TR=C0:GOSUB BPOS:? " Left o
   ffscr  Onscreen     Right offscr"
JX 4215 IDIS=13:I$=WPMI$:GOSUB MENUSEL
KU 4220 IF ITEM=-C1 THEN ITEM=C1:RETURN
WW 4225 ON ITEM+C1 GOSUB 4230,4280,4330
QR 4226 GOTO 4210
DL 4230 VAR4=(PEEK(DCASE)=UC)*60+C1:GOSUB
    PTR
OP 4235 IF VAR4=-C1 THEN RETURN
FQ 4240 GOSUB DLI
WJ 4245 IF VAR1-LEN(TEXT$)<C0 THEN 4380
UB 4250 DUM=USR(ADR(PPMOVE$),ADR(TEXT$)-C
   1,PEEK(VAR)*256+VAR1-LEN(TEXT$)-C1,LEN
   (TEXT$))
QH 4255 SH=C4:IF SP+SH>SL THEN GOSUB IMEM
   :RETURN
ZE 4256 GOSUB IS
KW 4260 S$(SP,SP+C2)="010"
PY 4265 S$(SP+C3,SP+C3)=CHR$(ROW):SP=SP+S
   H
BV 4275 RETURN
YU 4280 IF LEN(TEXT$)>20 THEN 4285
TG 4281 COL=10-INT(LEN(TEXT$)/C2)
TW 4285 VAR4=52:GOSUB PTR:IF VAR4=-C1 THE
   N RETURN
GF 4290 GOSUB DLI
CG 4295 IF VAR1+COL+LEN(TEXT$)>255 THEN 4
   380
NW 4300 DUM=USR(ADR(PPMOVE$),ADR(TEXT$)-C
   1,PEEK(VAR)*C256+VAR1+COL-C1,LEN(TEXT$
   ))
QE 4305 SH=C5:IF SP+SH>SL THEN GOSUB IMEM
   :RETURN
XW 4310 GOSUB IS
LZ 4315 S$(SP,SP+C2)="011"
NG 4320 S$(SP+C3,SP+C3)=CHR$(ROW):S$(SP+C
   4,SP+C4)=CHR$(COL):SP=SP+SH
BI 4325 RETURN
LS 4330 VAR4=(PEEK(DCASE)=UC)*55+C4:GOSUB
    PTR
OR 4335 IF VAR4=-C1 THEN RETURN
FS 4340 GOSUB DLI
EX 4345 IF VAR1+19+LEN(TEXT$)>255 THEN 43
   80
XO 4350 DUM=USR(ADR(PPMOVE$),ADR(TEXT$)-C
   1,PEEK(VAR)*C256+VAR1+19,LEN(TEXT$))
QJ 4355 SH=C4:IF SP+SH>SL THEN GOSUB IMEM
   :RETURN
ZG 4356 GOSUB IS
LW 4360 S$(SP,SP+2)="012"
QA 4365 S$(SP+C3,SP+C3)=CHR$(ROW):SP=SP+S
   H
BX 4375 RETURN
GG 4380 TC=C0:TR=C1:GOSUB BPOS
YY 4381 ? "      Sorry, text will not fit
   there.    "
MF 4382 ? "               Try CLEARing line.
        ";
ZM 4383 GOSUB PAUSE
RD 4384 GOTO 4210
BB 4400 REM W_CLEAR
FQ 4405 ITEM=C1
EX 4410 TC=C0:TR=C0:GOSUB BPOS
WF 4415 ? " Char      Line       Display";
ZJ 4420 IDIS=9:I$=CMI$:GOSUB MENUSEL
KG 4425 ON ITEM+C1 GOSUB 4500,4435,4455
ME 4430 IF ITEM=-C1 THEN ITEM=C2:RETURN
RC 4431 GOTO 4410
BP 4435 VAR4=(PEEK(DCASE)=LC)*22+C3:GOSUB
    PTR:IF VAR4=-C1 THEN RETURN
GP 4436 GOSUB DLI
JN 4440 DUM=USR(ADR(PCLEAR$),VAR2)
XY 4441 POKE VAR-C1,117
PW 4442 SH=C4:IF SP+SH>SL THEN GOSUB IMEM
   :RETURN
YT 4443 GOSUB IS
NF 4445 S$(SP,SP+C2)="021"
QA 4446 S$(SP+C3,SP+C3)=CHR$(ROW):SP=SP+S
   H
AZ 4450 RETURN
ZH 4455 TC=C0:TR=C2:GOSUB BPOS:? "Clear s
   creen?";
XN 4456 GOSUB 300
MR 4459 IF ITEM=-C1 THEN ITEM=C1:RETURN
GG 4460 ON ITEM+C1 GOTO 4465,4485
CL 4465 GOSUB 1350
PN 4470 SH=C3:IF SP+SH>SL THEN GOSUB IMEM
   :RETURN
ZK 4475 GOSUB IS
LI 4480 S$(SP,SP+C2)="022":SP=SP+C3
CC 4485 RETURN
HO 4500 REM CLEAR CHAR
AR 4510 VAR4=(PEEK(DCASE)=LC)*22+C3:GOSUB
    PTR:IF VAR4=-C1 THEN RETURN
FQ 4520 GOSUB DLI
TD 4530 POKE VAR2*C256+VAR1+COL,0
QR 4535 SH=C5:IF SP+SH>SL THEN GOSUB IMEM
   :RETURN
YJ 4540 GOSUB IS
HO 4545 S$(SP,SP+C2)="020":S$(SP+C3,SP+C3
   )=CHR$(ROW):S$(SP+C4,SP+C4)=CHR$(COL):
   SP=SP+C5
BB 4550 RETURN
NT 4700 REM PAUSE
OF 4705 TC=C0:TR=C2:GOSUB BPOS:? " Select
    time"
GM 4710 ITEM=C7:GOSUB COLSEL:VAR2=ITEM:IF
    VAR2=-C1 THEN ITEM=C2:RETURN
RL 4715 ITEM=C2:SH=C2:IF SP+SH>SL THEN GO
   SUB IMEM:RETURN
YH 4720 GOSUB IS
FJ 4725 S$(SP,SP)="2":S$(SP+C1,SP+C1)=CHR
   $(VAR2+C1):SP=SP+SH
AZ 4730 RETURN
EJ 4900 TC=C0:TR=C0:GOSUB BPOS:? " 0 1 2
   3 4 5 6 7 8 9 0 1 2 3 4 5":I$="!!!!!!!
   !!!!!!!!!"
OM 4910 IDIS=C2:GOSUB MENUSEL
GQ 4920 TC=C0:TR=C2:GOSUB BPOS
BD 4930 RETURN
UP 4940 TC=C0:TR=C0:GOSUB BPOS:? " 1 2 3
   4 5 6 7 8":I$=SPEEDMI$(1,8):GOTO 4910
HM 5000 REM SCROLL
EX 5005 ITEM=C0
EQ 5010 TC=C0:TR=C0:GOSUB BPOS
OY 5020 ? SMENU$;
JB 5030 IDIS=9:I$=SMI$:GOSUB MENUSEL
KX 5040 IF ITEM=-C1 THEN ITEM=C1:RETURN
AD 5050 ON ITEM+C1 GOSUB 5100,6000
PP 5060 GOTO 5010
KR 5100 REM S_LINE
EZ 5105 ITEM=C0
ES 5110 TC=C0:TR=C0:GOSUB BPOS
EW 5120 ? SLMENU$;
AA 5130 IDIS=7:I$=SLMI$:GOSUB MENUSEL
JW 5140 IF ITEM=-C1 THEN ITEM=C0:RETURN
QB 5150 ON ITEM+C1 GOSUB 5200,5500,5500,5
   200
QD 5160 GOTO 5110
CF 5200 REM L/R
AB 5205 TC=C0:TR=C0:GOSUB BPOS:? " Select
    line";
HA 5210 DIST=C0
KY 5215 DIR=(ITEM-1.5)/1.5
GB 5220 IF PEEK(DCASE)=UC THEN VAR4=DIR+2
   9:GOTO 5230
NN 5225 VAR4=(DIR+C1)/C2+30
GA 5230 GOSUB PTR:IF VAR4=-C1 THEN RETURN
HR 5235 GOSUB BPOS:? " Select distance";
GL 5240 POKE 764,255
VY 5245 GOSUB DLI:OLDCOL=VAR1
YY 5250 GOSUB DISTSEL
GV 5260 IF VAR2=-C1 THEN POKE VAR-C1,OLDC
   OL:RETURN
NJ 5270 IF VAR2=12 THEN 5350
LH 5300 GOSUB DLI:VAR1=VAR1-DIR
YM 5310 IF VAR1>C0 AND VAR1<255 THEN POKE
    VAR-C1,VAR1:DIST=DIST+C1
SH 5320 GOTO 5250
TT 5350 IF  NOT DIST THEN RETURN
SQ 5355 GOSUB SPEEDSEL
QX 5360 SH=C7:IF SP+SH>SL THEN GOSUB IMEM
   :RETURN
YP 5370 GOSUB IS
LV 5375 S$(SP,SP+C2)="100"
NQ 5380 S$(SP+C3,SP+C3)=CHR$(ROW):S$(SP+C
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   4,SP+C4)=CHR$(DIR+C1):S$(SP+C5,SP+C5)=CHR$(DIST):S$(SP+C6,SP+C6)=CHR$(ITEM)
SP 5390 SP=SP+SH:ITEM=(DIR+C1)*1.5:RETURN
ZL 5500 REM U/D
AH 5505 TC=C0:TR=C0:GOSUB BPOS:? " Select line";
IW 5510 DIST=C0:DIR=C3-(ITEM*C2)
HA 5520 IF PEEK(DCASE)=UC THEN VAR4=-DIR*C4+58:GOTO 5525
TQ 5521 VAR4=(DIR+C1)/C2+28
UV 5525 GOSUB PTR
OC 5530 IF VAR4=-C1 THEN RETURN
HX 5535 GOSUB BPOS:? " Select distance";
GR 5540 POKE 764,255
ZE 5550 GOSUB DISTSEL
XD 5560 IF VAR2=-C1 THEN 5550
QG 5570 IF VAR2=12 THEN 5650
FN 5600 GOSUB DLI
FQ 5605 DIST=DIST+1
EB 5610 IF (ROW=C0 AND DIR=-C1) OR (ROW=9 AND DIR=C1) THEN 5640
BK 5615 VAR3=VAR+C3*DIR
GW 5616 DUM=USR(ADR(PCLEAR$),PEEK(VAR3))
LV 5620 POKE VAR,PEEK(VAR3):POKE VAR3-C1,VAR1:POKE VAR3,VAR2:POKE VAR-C1,117
GE 5625 ROW=ROW+DIR
UA 5630 GOTO 5550
AY 5640 DUM=USR(ADR(PCLEAR$),VAR2):POKE VAR-C1,117
TZ 5650 IF  NOT DIST THEN RETURN
SW 5655 GOSUB SPEEDSEL
RD 5660 SH=C7:IF SP+SH>SL THEN GOSUB IMEM:RETURN
YV 5670 GOSUB IS
MX 5675 S$(SP,SP+C2)="101"
EG 5680 IF ROW-DIR*DIST<0 THEN DIST=DIST-1:GOTO 5680
CE 5681 S$(SP+C3,SP+C3)=CHR$(ROW-DIR*DIST):S$(SP+C4,SP+C4)=CHR$(DIR+C1):S$(SP+C5,SP+C5)=CHR$(DIST)
HI 5685 S$(SP+C6,SP+C6)=CHR$(ITEM):SP=SP+SH
HJ 5690 ITEM=(C3-DIR)/C2:RETURN
LK 5800 REM DISTANCE
VK 5810 VAR2=PEEK(764):IF VAR2<255 THEN POKE 764,255:GOTO 5850
PH 5815 IF (STICK(C0)=11 AND ITEM=C0) OR (STICK(C0)=C7 AND ITEM=C3) THEN 5890
YH 5820 IF (STICK(C0)=14 AND ITEM=C2) OR (STICK(C0)=13 AND ITEM=C1) THEN 5890
CM 5830 IF  NOT STRIG(C0) THEN VAR2=12:GOTO 5890
UI 5835 GOTO 5810
SX 5850 IF VAR2=28 THEN VAR2=-C1:RETURN
WM 5855 IF VAR2=12 THEN 5890
XM 5860 IF VAR2=33 THEN 5890
HY 5865 IF (VAR2=C6 AND ITEM=C0) OR (VAR2=C7 AND ITEM=C3) THEN 5890
PW 5870 IF (VAR2=14 AND ITEM=C1) OR (VAR2=15 AND ITEM=C2) THEN 5890
UU 5875 GOTO 5810
NV 5890 GOSUB CLICK:RETURN
ZP 5900 REM SPEED MENU
WC 5910 ITEM=SPEED:TC=C0:TR=C0:GOSUB BPOS:? SPEEDMENU$;
HS 5930 TC=C0:TR=C2:GOSUB BPOS:? " Select speed"
JS 5940 IDIS=C3:I$=SPEEDMI$:GOSUB MENUSEL:IF  NOT (ITEM+C1) THEN ITEM=C5:GOTO 5940
JD 5950 SPEED=ITEM
HD 5960 TC=C0:TR=C2:GOSUB BPOS
BQ 5970 RETURN
CM 6000 REM S_SCREEN
EH 6010 ITEM=C0
FB 6020 TC=C0:TR=C0:GOSUB BPOS:? SLMENU$;
NJ 6030 IDIS=C7:I$=SLMI$:GOSUB MENUSEL
KY 6040 IF ITEM=-C1 THEN ITEM=C1:RETURN
SH 6050 ON ITEM+C1 GOSUB 6100,6500,6500,6100
QO 6060 GOTO 6020
CE 6100 REM L/R
LE 6105 DIST=C0:DIR=(ITEM-1.5)/1.5:SCRH$(C4,C4)=CHR$(238-16*DIR)
YO 6110 TC=C0:TR=C2:GOSUB BPOS:? " Select distance"
ZF 6115 GOSUB DISTSEL
UT 6120 IF VAR2=-C1 THEN 6115
MP 6125 IF VAR2=12 THEN 6150
PK 6130 DUM=USR(ADR(SCRH$))
TO 6135 DIST=DIST+C1:GOTO 6115
TQ 6150 IF  NOT DIST THEN RETURN
RW 6160 GOSUB SPEEDSEL
RE 6165 SH=C6:IF SP+SH>SL THEN GOSUB IMEM:RETURN
YM 6170 GOSUB IS
VM 6175 S$(SP,SP+C2)="110":S$(SP+C3,SP+C3)=CHR$(DIR+C1):S$(SP+C4,SP+C4)=CHR$(DIST):S$(SP+C5,SP+C5)=CHR$(ITEM)
KC 6180 SP=SP+C6:ITEM=(DIR+1)*1.5:RETURN
ZM 6500 REM U/D
RT 6505 DIST=C0:DIR=C3-ITEM*C2
YW 6510 TC=C0:TR=C2:GOSUB BPOS:? " Select distance"
ZN 6515 GOSUB DISTSEL
YT 6520 IF VAR2=-C1 THEN 6515
MS 6525 IF VAR2=12 THEN 6600
WS 6530 ON ITEM GOTO 6540,6560
PE 6540 VAR1=PEEK(DL+27):DUM=USR(ADR(PCLEAR$),VAR1):DUM=USR(ADR(SCRD$)):POKE DL,VAR1:POKE DL-C1,117:GOTO 6580
KU 6560 VAR1=PEEK(DL):DUM=USR(ADR(PCLEAR$),VAR1):DUM=USR(ADR(SCRU$)):POKE DL+27,VAR1:POKE DL+26,117
XN 6580 DIST=DIST+C1:GOTO 6515
TL 6600 IF  NOT DIST THEN RETURN
SI 6605 GOSUB SPEEDSEL
QF 6610 SH=C6:IF SP+SH>SL THEN GOSUB IMEM:RETURN
YY 6615 GOSUB IS
VJ 6620 S$(SP,SP+C2)="111":S$(SP+C3,SP+C3)=CHR$(DIR+C1):S$(SP+C4,SP+C4)=CHR$(DIST):S$(SP+C5,SP+C5)=CHR$(ITEM)
KI 6625 SP=SP+C6:ITEM=(C3-DIR)/C2:RETURN
LI 8000 REM OPTIONS
FA 8005 ITEM=C0
ET 8010 TC=C0:TR=C0:GOSUB BPOS
JI 8015 ? " Shift  Color  Blink  Misc";
QB 8020 IDIS=C7:I$=OMI$:GOSUB MENUSEL
NU 8025 IF ITEM=-C1 THEN ITEM=C3:RETURN
KV 8030 ON ITEM+C1 GOSUB 8100,8200,8300,20000
QT 8040 GOTO 8010
VW 8100 REM CASE TOGGLE
TL 8110 IF PEEK(DCASE)=UC THEN POKE DCASE,LC:GOTO 8125
NZ 8120 POKE DCASE,UC
PQ 8125 SH=C3:IF SP+SH>SL THEN GOSUB IMEM:RETURN
YC 8130 GOSUB IS
PI 8135 S$(SP,SP+C1)="30":S$(SP+C2,SP+C2)=CHR$(PEEK(DCASE)):SP=SP+C3
YO 8140 GOSUB PAUSE
BO 8145 RETURN
PH 8200 REM COLOR
SV 8205 GOSUB CASESEL:IF ITEM=-C1 THEN ITEM=C1:RETURN
QG 8206 VAR3=PEEK(203+CASE):VAR4=INT(VAR3/16):ITEM=VAR4
FP 8210 TC=C0:TR=C2:GOSUB BPOS:? " Select color";:GOSUB COLSEL:COLVAR=ITEM:IF ITEM=-C1 THEN ITEM=C1:RETURN
SE 8211 ITEM=INT((VAR3-VAR4*16)/C2)
BW 8215 TC=C0:TR=C2:GOSUB BPOS:? " Select luminance";:GOSUB 4940:IF ITEM=-C1 THEN ITEM=C1:RETURN
AJ 8220 VAR2=COLVAR*16+ITEM*C2:POKE 203+CASE,VAR2:POKE 708+CASE,VAR2
QC 8225 SH=C4:IF SP+SH>SL THEN GOSUB IMEM:RETURN
YE 8230 GOSUB IS
VZ 8235 S$(SP,SP+C1)="31":S$(SP+C2,SP+C2)=CHR$(CASE):S$(SP+C3,SP+C3)=CHR$(VAR2):SP=SP+SH
BI 8240 ITEM=C1:RETURN
IB 8300 REM BLINK
AJ 8310 IF PEEK(208)>0 THEN VAR4=-C1:VAR3=C1:GOTO 8370
YQ 8315 IF CASE>C3 THEN CASE=C3
UJ 8320 I$=CASEMI$(C1,C4):TC=C0:TR=C0:GOSUB BPOS:? CASEMENU$(C1,27):GOSUB 8910
MG 8330 IF ITEM=-C1 THEN ITEM=C2:RETURN
MZ 8340 VAR4=ITEM:TC=C0:TR=C2:GOSUB BPOS:? " Blinking rate?":ITEM=C4:GOSUB 4940
MM 8350 IF ITEM=-C1 THEN ITEM=C2:RETURN
OF 8360 VAR3=2^(7-ITEM):POKE 1721,VAR3
BT 8370 POKE 208,VAR4+C1
QT 8375 SH=C4:IF SP+SH>SL THEN GOSUB IMEM:RETURN
YV 8380 GOSUB IS
BJ 8385 S$(SP,SP+C1)="32":S$(SP+C2,SP+C2)=CHR$(VAR4+C1):S$(SP+C3,SP+C3)=CHR$(VAR3):SP=SP+SH
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EJ 8390 ITEM=C2:GOSUB PAUSE:RETURN
RG 8900 REM CASE SEL
VQ 8905 I$=CASEMI$:TC=C0:TR=C0:GOSUB BPOS
   :? CASEMENU$
NO 8910 ITEM=CASE
OL 8915 IDIS=C7:GOSUB MENUSEL:IF ITEM+C1
   THEN CASE=ITEM
BE 8920 RETURN
BH 9000 REM SCRIPT LOAD
YG 9005 ? "K";:POKE 752,0:? "Load file";:
   INPUT FILE$:POKE 752,1
QL 9010 TRAP 9050:OPEN #1,4,0,FILE$:TRAP
   40000:CLOSE #1
VR 9015 VAR2=LEN(FILE$):SH=C2+VAR2:IF SP+
   SH>SL THEN GOSUB IMEM:RETURN
XY 9020 GOSUB IS
YH 9025 S$(SP,SP)="4":S$(SP+C1,SP+C1)=CHR
   $(VAR2):S$(SP+C2,SP+C1+VAR2)=FILE$:SP=
   SP+C2+VAR2
CM 9030 ITEM=C4:RETURN
BZ 9050 ? "K";:TC=C0:TR=C1:GOSUB BPOS:? "
   Can't find ";FILE$:? " Proceed anyway
   ?";
DZ 9055 GOSUB 300:IF ITEM THEN ITEM=4:RET
   URN
UD 9060 GOTO 9015
ZS 10000 REM EDIT
QG 10010 GOSUB RESET
SF 10015 SP=C1:TEMP$=" BEGINNING":FLAG=C1

DE 10020 TC=C0:TR=C2:GOSUB BPOS:? TEMP$;
GE 10025 POKE 764,255:GOSUB 10240
HX 10030 OSP=SP:GOSUB 1050
LQ 10035 GOSUB 10100
HI 10040 IF ITEM=-C1 THEN GOSUB 1350:SP=L
   EN(S$)+C1:ITEM=C2:? "K";:RETURN
CJ 10045 IF SP<LEN(S$) THEN 10030
GJ 10050 ITEM=C2:? "K":RETURN
CZ 10100 TC=C0:TR=C2:GOSUB BPOS:? TEMP$;
HD 10110 ITEM=C0
WC 10115 TC=C0:TR=C0:GOSUB BPOS
ZA 10120 ? " Continue Delete    Insert";

YK 10125 IDIS=10:I$=EMI$:GOSUB MENUSEL+10

YT 10130 IF ITEM=-C1 OR  NOT ITEM THEN RE
   TURN
LQ 10140 ON ITEM GOSUB 10200,950
DU 10150 RETURN
DU 10200 REM DELETE STEP
NG 10205 IF SP=C1 THEN RETURN
RM 10210 TC=C0:TR=C2:GOSUB BPOS:? " Delet
   e last step?";
DB 10215 GOSUB 300
JF 10225 IF ITEM=-C1 OR ITEM THEN ITEM=C1
   :RETURN
LS 10230 IF SP>LEN(S$) THEN S$(OSP)="":SP
   =OSP:RETURN
HR 10235 S$(OSP)=S$(SP):SP=OSP
GU 10240 TC=C0:TR=C0:GOSUB BPOS:? " Conti
   nue            Insert";
WC 10250 IDIS=20:I$=EDMI$:ITEM=C0:GOSUB M
   ENUSEL
AD 10255 IF ITEM=-C1 OR  NOT ITEM THEN RE
   TURN
OQ 10260 GOSUB 950:RETURN
TI 12000 REM DATA
FY 12100 REM ML CODE
GO 12135 REM DLI#1
JR 12136 DATA 72,169,224,141,9,212,165,20
   4,141,23,208,165,205,141,24,208,169,17
   4,141,0,2,104,64
GI 12140 REM DLI#2
KI 12141 DATA 72,138,72,165,208,170,240,1
   9,165,20,41,32,240,5,165,207,157,21,20
   8,76,201,6,181,202,157,21,208
XK 12142 DATA 169,151,141,0,2,104,170,104
   ,64
AX 12190 REM DL
OA 12192 DATA 112,112,128,208,71,117,0,71
   ,117,0,71,117,0,71,117,0,71,117,0,71,1
   17,0,71,117,0,71,117,0
ER 12193 DATA 71,117,0,71,117,0,128,66,0,
   0,2,2,2,65,210,6
UB 12300 REM MENU SEARCH LISTS
LK 12309 DATA 10,40,42,0,62,35,47
OW 12310 DATA 46,62,10,8,0
NC 12311 DATA 42,10,18,8
RI 12312 DATA 43,35
TJ 12313 DATA 0,8,40
NM 12314 DATA 0,58
JQ 12315 DATA 0,58,11,40
PA 12316 DATA 31,30,26,24,29,27,51,53,48,
   50
GE 12317 DATA 62,18,21,37
SO 12318 DATA 18,58,13
HY 12319 DATA 18,0,58
KM 12320 DATA 11,0,75,64,21
GY 12321 DATA 56,31,30,26,24
MJ 12322 DATA 13,8
QK 12323 DATA 18,13
HB 12500 REM VARIABLES
KD 12501 C0=0:C1=1:C2=2:C3=3:C4=4:C5=5:C6
   =6:C7=7:C256=256
YY 12505 GRAPHICS C0:POKE 752,C1:POSITION
   11,11:? "  Initializing  "
UX 12510 DIM PCLEAR$(19),PPMOVE$(24),TRAN
   S$(59),CIO$(6),SCRH$(12),SCRD$(21),SCR
   U$(24)
WT 12520 DIM QMENU$(40),SMENU$(40),SLMENU
   $(40),SPEEDMENU$(29),CASEMENU$(39)
JH 12530 DIM BLANK$(40),TEXT$(119),TEMP$(
   128),OLDCHAR$(1)
YY 12540 DIM I$(16),MMI$(7),RMI$(5),WMI$(
   4),QMI$(2),WPMI$(3),SMI$(2),SLMI$(4),S
   PEEDMI$(10),OMI$(4)
JN 12545 DIM EMI$(3),CMI$(3),CASEMI$(5),M
   ISCMI$(5),FADEMI$(2),EDMI$(2)
KF 12550 DIM S$(5000):SL=5000
IJ 12560 DIM FILE$(14)
HD 12600 REM SETUP
KN 12605 RL=140
ME 12610 PCLEAR$="hhh[illegible]"
SS 12620 PPMOVE$="hh[illegible]"

SG 12630 TRANS$="hh[illegible]"
WT 12635 CIO$="h[illegible]LV[illegible]"
YY 12640 SCRH$="h[illegible]"
BT 12641 SCRD$="h[illegible]"
KR 12642 SCRU$="h[illegible]"

EA 12645 FOR IT=C0 TO 22:READ VAR:POKE 16
   64+IT,VAR:POKE 1687+IT,VAR:NEXT IT
SJ 12646 VAR=1687:POKE VAR+C6,169:POKE VA
   R+C7,202:POKE VAR+11,169:POKE VAR+12,1
   48:POKE VAR+17,128
NT 12650 FOR IT=C0 TO 35:READ VAR:POKE 17
   10+IT,VAR:NEXT IT
BG 12690 FOR IT=C0 TO 43:READ VAR:POKE 17
   46+IT,VAR:NEXT IT
VH 12700 BLANK$="
                                        "
AO 12705 VAR=C7:GOSUB RL:MMI$=TEMP$
DG 12710 VAR=C5:GOSUB RL:RMI$=TEMP$
IE 12715 VAR=C4:GOSUB RL:WMI$=TEMP$
IT 12720 QMENU$=" Yes  No"
BI 12721 VAR=C2:GOSUB RL:QMI$=TEMP$
AN 12725 VAR=C3:GOSUB RL:WPMI$=TEMP$
WI 12730 SMENU$=" Line        Display"
DG 12731 VAR=C2:GOSUB RL:SMI$=TEMP$
CE 12735 SLMENU$=" Left    Down    Up    R
   ight"
UC 12736 VAR=C4:GOSUB RL:SLMI$=TEMP$
FV 12740 SPEEDMENU$=" 1  2  3  4  5  6  7
   8  9  0"
BX 12741 VAR=10:GOSUB RL:SPEEDMI$=TEMP$
BO 12745 VAR=C4:GOSUB RL:OMI$=TEMP$
SK 12755 VAR=C3:GOSUB RL:EMI$=TEMP$
PV 12760 VAR=C3:GOSUB RL:CMI$=TEMP$
PZ 12765 CASEMENU$=" Upper  Lower  UPPER
   LOWER  Background"
JD 12766 VAR=C5:GOSUB RL:CASEMI$=TEMP$
WJ 12770 VAR=C5:GOSUB RL:MISCMI$=TEMP$
VY 12775 VAR=C2:GOSUB RL:FADEMI$=TEMP$
ZA 12780 VAR=C2:GOSUB RL:EDMI$=TEMP$
GM 12800 DL=1752:DCASE=1666
YK 12805 ROW=C0:COL=C0
BA 12810 SP=C1:CASE=C0:SPEED=C5
TK 12850 TPOS=500:BPOS=580:PAUSE=530:MENU
   SEL=600:CLICK=100:PTR=330:IMEM=160:GI=
   185:DLI=200:HILO=220:IS=250
RM 12855 SPEEDSEL=5900:DISTSEL=5800:COLSE
   L=4900:CASESEL=8900:RESET=410
ER 12900 GRAPHICS C2
SE 12905 REM POKE 559,C0
DM 12910 VAR=PEEK(661)-10:VAR1=VAR-C2*INT
   (VAR/C2)
BW 12915 POKE 741,255:POKE 742,VAR-C3-VAR
   1
WX 12920 FOR IT=C0 TO 9:POKE DL+C3*IT,VAR
   +IT:NEXT IT
ER 12925 POKE DL+30,PEEK(660):POKE DL+31,
   PEEK(661)
```

continued on next page

```
VL 12930 POKE 560,210:POKE 561,C6
GJ 12935 POKE 82,C0
SK 12940 FOR IT=C0 TO 9:DUM=USR(ADR(PCLEA
   R$),PEEK(DL+IT*C3)):NEXT IT
PG 12945 POKE 752,C1
RR 12950 LC=VAR-C2-VAR1
YK 12955 FOR IT=C0 TO C1:DUM=USR(ADR(PPMO
   VE$),(PEEK(756)+C2+IT)*C256,(LC+IT)*C2
   56,C0):NEXT IT
FF 12960 FOR IT=LC*C256 TO LC*C256+C7:POK
   E IT+488,PEEK(IT):POKE IT,C0:NEXT IT
TA 12970 POKE 54286,192
XM 12971 POKE 512,128:POKE 513,C6
EV 12972 UC=224:REM VAR=PEEK(756):POKE 17
   10+C2,VAR:POKE 1725+C2,VAR:UC=VAR
KO 12975 FOR IT=C0 TO C4:POKE 203+IT,PEEK
   (708+IT):NEXT IT:POKE 208,C0
KA 12990 POKE 559,34
XP 12995 GOSUB CLICK:GOTO 900
VJ 13000 REM LOAD
XN 13010 ? "■";:FLAG=2
GB 13020 POKE 694,C0:POKE 702,64:POKE 752
   ,C0:? "Load file";:INPUT FILE$:POKE 75
   2,C1
ZU 13030 IF FILE$="" THEN RETURN
PN 13040 POKE 559,C0
CE 13050 TRAP 13150:OPEN #1,C4,C0,FILE$:T
   RAP 40000
MH 13060 S$=" ":SP=1:GOSUB RESET
CU 13070 INPUT #1,VAR:GOSUB HILO:S$(VAR,V
   AR)=" "
IY 13080 POKE 848+C2,C7
JR 13090 POKE 848+8,LO:POKE 848+9,HI
UR 13100 VAR=ADR(S$):GOSUB HILO
RY 13110 POKE 848+C4,LO:POKE 848+C5,HI
ZI 13120 DUM=USR(ADR(CIO$))
UU 13130 POKE 559,34:CLOSE #1:RETURN
OU 13150 POKE 559,34:CLOSE #1:TRAP 40000:
   RETURN
HQ 13160 ? "■";:? " Can't load ";FILE$
OI 13170 GOSUB PAUSE
JB 13180 ? "■":RETURN
DD 13200 REM SAVE
IA 13210 ? "■";
IA 13220 POKE 694,C0:POKE 702,64:POKE 752
   ,C0:? "Save file";:INPUT FILE$:POKE 75
   2,C1
AA 13230 IF FILE$="" THEN RETURN
IW 13240 POKE 559,C0:TRAP 13350
GL 13250 OPEN #1,8,C0,FILE$:TRAP 40000
YU 13260 VAR=LEN(S$):GOSUB HILO
VK 13270 ? #1,VAR
RK 13280 POKE 848+C2,11
JX 13290 POKE 848+8,LO:POKE 848+9,HI
UX 13300 VAR=ADR(S$):GOSUB HILO
SE 13310 POKE 848+C4,LO:POKE 848+C5,HI
ZO 13320 DUM=USR(ADR(CIO$))
VA 13330 POKE 559,34:CLOSE #1:RETURN
VS 13350 POKE 559,34:CLOSE #1:TRAP 40000
WX 13360 ? "■";:? " Can't save ";FILE$
OO 13370 GOSUB PAUSE
JH 13380 ? "■":RETURN
SL 13400 REM NEW
EN 13405 TC=C0:TR=C2:GOSUB BPOS:? " Delet
   e current script?";
CO 13410 GOSUB 300
NG 13430 IF ITEM THEN ITEM=C0:GOTO 13455
RK 13440 GOSUB RESET
AK 13450 S$="":SP=C1
YP 13455 TC=C0:TR=C2:GOSUB BPOS
EN 13460 RETURN
BH 20000 REM MISC
HW 20005 ITEM=C0
MN 20010 TC=C0:TR=C0:GOSUB BPOS:? " Fade
   1User  2User  3User  4User";
AD 20015 IDIS=7:I$=MISCMI$:GOSUB MENUSEL
YL 20020 IF ITEM=-C1 THEN ITEM=C2:RETURN
AF 20025 ON ITEM+C1 GOSUB 20050
WU 20030 GOTO 20010
OZ 20050 REM FADE
IQ 20055 ITEM=C0
BD 20060 TC=C0:TR=C0:GOSUB BPOS:? " In
   Out";
AR 20065 IDIS=C5:I$=FADEMI$:GOSUB MENUSEL
WX 20070 IF ITEM=-C1 THEN ITEM=C0:RETURN
ZT 20075 DIR=C1-ITEM*C2:VAR4=203+CASE
PU 20080 GOSUB CASESEL:IF ITEM=-C1 THEN I
   TEM=C0:RETURN
UH 20090 VAR4=203+CASE:VAR3=PEEK(VAR4):CO
   LVAR=INT(VAR3/16)
IE 20100 VAR2=VAR3-COLVAR*16:IF (VAR2<C2
   AND DIR=-C1) OR (VAR2>13 AND DIR=C1) T
   HEN 20110
SH 20105 VAR3=VAR3+DIR*C2:POKE VAR4,VAR3:
   POKE 708+CASE,VAR3:GOTO 20100
OQ 20110 GOSUB SPEEDSEL
MN 20115 SH=6:IF SP+SH>SL THEN GOSUB IMEM
   :ITEM=C0:RETURN
EI 20120 GOSUB IS
ZU 20125 S$(SP,SP+C2)="330":S$(SP+C3,SP+C
   3)=CHR$(DIR+C1):S$(SP+C4,SP+C4)=CHR$(C
   ASE):S$(SP+C5,SP+C5)=CHR$(SPEED)
TQ 20130 SP=SP+SH:ITEM=C0:RETURN
JA 30000 REM EXIT
UB 30010 TC=C0:TR=C2:GOSUB BPOS:? " Reall
   y quit?"
CC 30020 GOSUB 300
PI 30030 IF ITEM THEN ITEM=C0:RETURN
CN 30110 GRAPHICS C0
JY 30120 POKE 82,C2:POKE 752,C0
```

LISTING 2

```
UH 10 REM SIGNBOARD, LISTING 2
BE 20 REM BY ANDREW R. THOMAS
FJ 30 REM (c) 1985,1987 ANTIC PUBLISHING
QA 35 REM CREATES LINES 12610 - 12642 FOR
    SIGN.BAS
EV 40 REM (LINES 10-250 MAY BE USED WITH
   OTHER BASIC LOADERS IN THIS ISSUE.
IJ 50 REM CHANGE LINE 70 AS NECESSARY.)
PR 60 DIM FN$(20),TEMP$(20),AR$(93):DPL=P
   EEK(10592):POKE 10592,255
WO 70 FN$="D:LINES.LST":REM THIS IS THE N
   AME OF THE DISK FILE TO BE CREATED
RD 80 ? "■Disk or Cassette?";:POKE 764,25
   5
PY 90 IF  NOT (PEEK(764)=18 OR PEEK(764)=
   58) THEN 90
TH 100 IF PEEK(764)=18 THEN FN$="C:"
VB 110 POKE 764,255:GRAPHICS 0:? "      AN
   TIC'S GENERIC BASIC LOADER"
MY 120 ? ,"BY CHARLES JACKSON"
KB 130 POKE 10592,DPL:TRAP 200
PU 140 ? :? :? "Creating ";FN$:? "...plea
   se stand by."
LW 150 RESTORE :READ LN:LM=LN:DIM A$(LN):
   C=1
BQ 160 AR$="":READ AR$
YC 170 FOR X=1 TO LEN(AR$) STEP 3:POKE 75
   2,255
DM 180 LM=LM-1:POSITION 10,10:? "(Countdo
   wn...T-";INT(LM/10);")     "
BK 190 A$(C,C)=CHR$(VAL(AR$(X,X+2))):C=C+
   1:NEXT X:GOTO 160
MM 200 IF PEEK(195)=5 THEN ? :? :? "■TOO
   MANY DATA LINES!":? "CANNOT CREATE FIL
   E!":END
CM 210 IF C<LN+1 THEN ? :? "■TOO FEW DATA
    LINES!":? "CANNOT CREATE FILE!":END
UQ 220 IF FN$="C:" THEN ? :? " Prepare ca
   ssette, press [RETURN]"
AR 230 OPEN #1,8,0,FN$
PV 240 POKE 766,1:? #1;A$;:POKE 766,0
AL 250 CLOSE #1:GRAPHICS 0:? "■COMPLETED■
   "
JB 1000 DATA 274
KY 1010 DATA 049050054049048032080067076
   069065082036061034104104133029169000
   133028160000169000145028200
ML 1020 DATA 208251096034155049050054050
   048032080077079086069036061034104104
   133031104133030104133029104
FM 1030 DATA 133028104104168177030145028
   136208249096034155049050054051048032084
   082065078083036061034104104
JE 1040 DATA 133029104133028104133031104
   133030104104168177028145030104170056233
   096144003024144015138056233
PO 1050 DATA 032144004170024144005138105
   064170024138010177028145030136145030
   136208214096034155049050054
QE 1060 DATA 051053032067073079036061034
   104162016076086228034155049050054052048
   032083067082072036061034104
FW 1070 DATA 162030222221200620220220220082
   048096034155049050054050049032083067082
   068036061034104162027189213
HX 1080 DATA 006157216006189212006157215O
   062022022022082039096034155049050054052
   050032083067082085036061034
JK 1090 DATA 1041620001600091892190061572
   160061892180006157215006232232232136208
   238096034155
```

TURBO-816

(upgrade)
DataQue Software
PO Box 134
Ontario, OH 44862
$159.95

The **Turbo-816** from DataQue Software adds 16-bit power to Atari 8-bit systems, while maintaining compatibility with current hardware and software, according to DataQue President Chuck Steinman. A plug-in module will be available for the XL/XE series, and a replacement CPU board is planned for the 400/800 computers; little or no soldering is required.

Also included in the package is the Turbo-OS, a replacement Operating-System ROM which takes advantage of the 16-bit power and the new high speed floating point routines. A user's guide and macro listing is supplied for assembly language programmers.

The Turbo-816 will not only increase the potential speed of the computer, but also break the 64K memory barrier of existing systems, not with the awkward paged memory, but with a fully linear decoded address space of up to 16 megabytes. Special memory boards will be available to take advantage of the new extended addressing range. All this, *and* compatibility with existing 8-bit products! If anything, existing programs should run faster with Turbo-816.

XF35 KIT, RAMDRIVE + 192K, IC CHIP

(hardware modifications)
Innovative Concepts
31172 Shawn Drive
Warren, MI 48093
(313) 293-0730

Now it's easy to upgrade your Atari XF551 disk drive to use the newer 3.5" drive, with the **XF35 Kit**. The $37.95 kit includes instructions, replacement ROM, and all cables required for the conversion (drive mechanism and mounting bracket are *not* included). According to I.C., the finished drive will work in the 720K formats with MyDOS, SpartaDOS, and the new SpartaDOS X cartridge. High speed skewing is still usable, and 40-track formats are also available for use with most other DOS types. Installation is simple, and requires only a minimal amount of soldering and desoldering.

Upgrade your Atari 130XE with **RAMdrive + 192K**. With this 192K-total memory upgrade you can set up a full single density RAMdisk, excellent for disk maintenance. The $37.95 kit includes handlers and utilities for Atari DOS 2.0 and 2.5, along with instructions on how to use it with Atari-Writer+, BASIC XE, MyDOS, TopDOS, SpartaDOS and the new SpartaDOS X cartridge. Installation requires some experience in soldering and desoldering.

The IC Chip is a replacement ROM for the Happy 1050 Board (original or clone). You'll no longer have to configure it for the U.S. Emulation Mode to read or write to SpartaDOS skewed disks. This "chip" does it automatically —and all other Happy functions are still available. Installation is just a matter of unplugging the old ROM and plugging in this new one. For only $32.95 you get the IC Chip plus two double-sided disks packed full of utilities.

L.A. SWAT, PANTHER

(games)
Mastertronic International
711 West 17th Street
Costa Mesa, CA 92627
(714) 631-1001
$9.99 , 64K disk

Shoot terrorists as part of a crime-fighting team in **L.A. SWAT**. Or rescue prisoners on an alien planet, flying your Panther Mini-Spacechip in **Panther**. Both adventures can be found on Mastertronic's new double-sided diskette.



LANGUAGE MASTER

(electronic dictionary/thesaurus)
Franklin Computer Corp.
122 Burrs Road
Mount Holly, NJ 08060
(609) 261-4800

A hand-held electronic dictionary, Franklin Computer's **Language Master 2000** ($299.95) provides concise definitions of over 80,000 words from Merriam-Webster's dictionary. Enter the word on the keyboard, and within seconds the definition, parts of speech, hyphenation points and inflected forms of the word appear on a large, four-line screen. If you don't know how a word is spelled, sound it out, and Language Master 2000 will give you a list of possible correct spellings, with easy dictionary access. Also included is a thesaurus of 35,000 entry words and 470,000 synonyms.

Franklin's newest addition, the **Language Master 3000** ($349.95), offers all the capabilities of the LM-2000, plus a variety of word games such as Hangman, Anagrams and Jumble. A Scrabble and crossword puzzle word list helps find difficult missing words. Specially designed logic strategy games, a vocabulary builder, and a special browsing function have also been added.

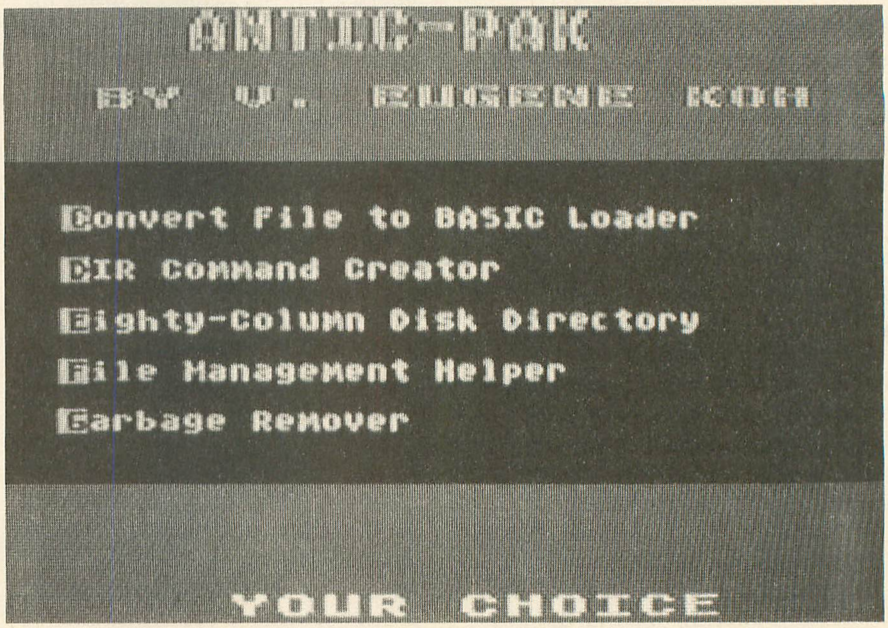
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Antic-PAK

Powerful BASIC disk utility collection.

• ***By Eugene Koh***

Antic-Pak is a collection of fast, powerful disk utilities, written in plain Atari BASIC with no machine language subroutines. Beginning BASIC programmers can take apart these modules and study them to learn more about disk management techniques. This BASIC program works on all 8-bit Atari computers of any memory size, with disk drive.



Antic-Pak is a collection of disk utilities, written in plain Atari BASIC with no machine language subroutines. It's fast, powerful, easy to use, and compatible with most printers. Most of its functions can be carried out equally well by BASIC and DOS, but with a structure that you can study directly, Antic-Pak provides an excellent demonstration of BASIC disk management techniques for the beginning programmer.

ANTIC-PAK PROGRAMS

Antic-Pak contains the following five complete program routines. Each one will run independently when you select it from the main menu. All you have to do is follow the onscreen prompts. To get started, Type in Listing 1, ANTICPAK.BAS, check it with TYPO II and SAVE a copy before you RUN it.

Convert File to BASIC Loader will take any file and turn it into raw decimal DATA statements with a BASIC Loader program on top. A BASIC Loader program is an easy-to-type program which creates a hard-to-type program.

The resulting file created with this program will be a BASIC loader program that the reader types in. When RUN, the loader will write the original file exactly as it was on the original disk. In addition, there is a checksum routine added to the loader that makes sure that every number the reader types in from the DATA statements is correct.

To use this routine, just type the

name of the file you wish to convert, (don't type in any D: device identifiers), then type the name to give the converted version. Finally, type the starting line number and the line number increment for the converted program. Antic-Pak will do the rest.

DIR Command Creator writes a command to disk that will let you bring up a two-column directory while in BASIC, with a simple ENTER command. The DIR Command Creator makes a one-sector file called DIR. Once this file is on your disk, just type **ENTER "D:DIR"** to get your two-column disk directory.

File Management Helper is a fast and easy menu program. It goes through the files on the disk one-by-one, letting you delete, rename, lock, and/or unlock each file with a single keypress.

The **Garbage Remover** utility for Atari BASIC Revision B users will fix a bug that can make files too long for memory, crashing programs before you realize it! Each time you LOAD and SAVE a program, BASIC appends 16 unnecessary bytes to it. The Garbage Remover gets rid of these extra bytes by LISTing your program to disk, typing NEW, then ENTERing it back again.

To learn more about this bug, see Matthew Ratcliff's Revision C Converter, (*Antic, Sept. '85.*)

To determine which version of BASIC you have, type **PRINT PEEK(43234)**. If you get a 162, you have Revision A BASIC. A 96 means you have Revision B and a 234 means you have Revision C.

The 80-Column Disk Directory utility will print out a space-saving disk directory in four columns, using the full capacity of your printer. ▲

Eugene Koh is a thirteen-year-old from Long Island, NY. His work was published in COMPUTE! Magazine prior to his **Antic** *debut here.*

Listing on page 25

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Flashy electronic billboards with your Atari.

By Andrew Thomas

SignMaker is a BASIC program that will turn an 8-bit Atari computer with at least 64K and disk into an electronic sign displaying as many as 10 lines of moving text in four colors, with scrolling, blinking, fading, uppercase and lowercase characters and graphics.

If you have a message to get across, electronic message display centers are a highly effective medium. Electronic signs attract and hold viewers' attention with an ever-changing display of scrolling messages and graphics.

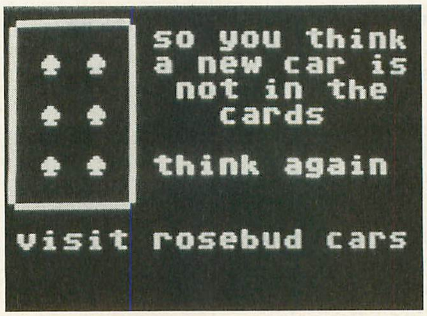
But these signs are expensive. A one-line indoor message center—the cheapest—costs several hundred dollars. And all that sign will do is display uppercase characters scrolling and maybe blinking.

SignMaker is a menu-driven editor that will turn your inexpensive 64K 8-bit Atari computer into an electronic sign with up to 10 lines of text, four colors, scrolling, blinking, fading, upper and lower case text and graphics.

GETTING STARTED

If you don't have a business, SignMaker can be used to title videos or as a high-tech refrigerator door. ("Billy!" <scroll left, blink, blink> "Don't forget to take out the trash!" <bright graphic of trashcan, just in case he's forgotten what it looks like>.)

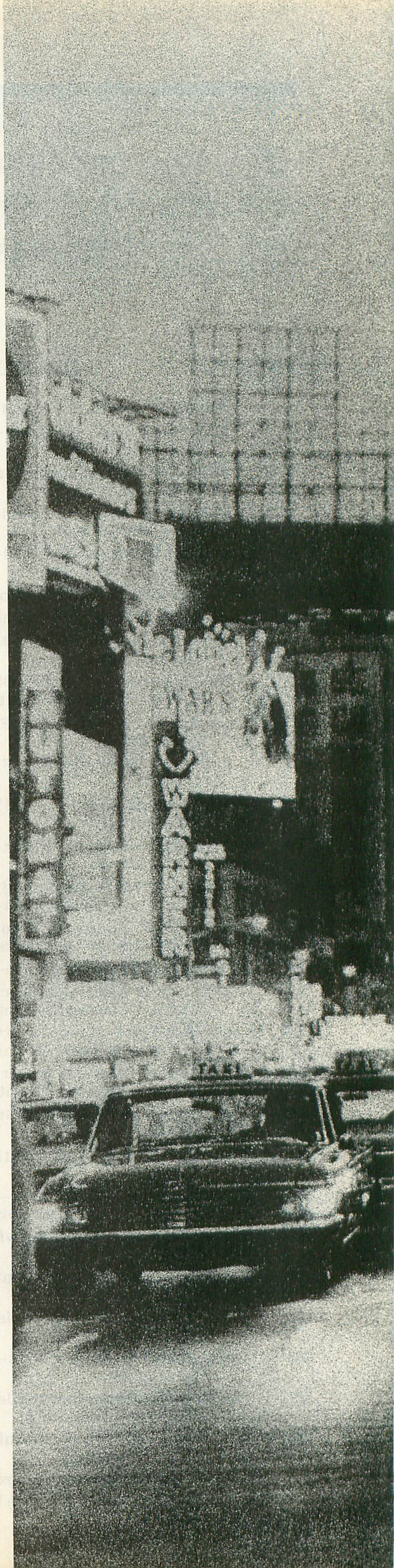
Type in Listing 1, SIGN.BAS, check it with TYPO II and SAVE a copy before you RUN it. Be especially careful typing the data and set-up section from 12000 to 13000. An error here can cripple the entire program.



If you have trouble typing the special characters in lines 12610-12642, don't type them in. Instead, type Listing 2, check it with TYPO II and SAVE a copy. When you RUN Listing 2, it creates these hard-to-type lines and stores them in a file called LINES.LST.

To merge the two programs, disk users LOAD "D:SIGN.BAS" and then ENTER "D:LINES.LST". Remember to SAVE the completed program before you RUN it.

SignMaker's menus are arranged in a branching "tree" structure. Choosing an item in a menu will often lead to yet another menu. Pressing [ESC]



SIGNMAKER



returns you to the previous menu.

Select items from the menu using either keyboard or joystick. The menu pointer can be moved with a joystick or the arrow keys. Press [RETURN] or the joystick button to select an item marked by the pointer. On most menus an item can also be selected by pressing its first character on the keyboard.

MAIN MENU

The main menu offers seven choices: [P]lay, [R]ecord, [E]dit, [L]oad, [S]ave, [N]ew and [Q]uit. Throughout SignMaker, you select a command simply by typing its first letter.

[P]lay: runs your message in a continuous loop onscreen.

[R]ecord: enter your message, or add on to an old one.

[E]dit: make changes to an existing message script.

[L]oad: load a message script from disk.

[S]ave lets you save your current message script to disk. The filename can be up to 14 characters long, including the directory specification; if the DOS you're using has longer filenames, the maximum size can be increased in the DIM statement in line 12560.

[N]ew clears the current sign from memory and screen, so you can start a fresh project.

To show you what you can do with SignMaker, a sample file has been included on this month's Antic disk. To play it, first [L]oad D:DISKS.SGC, then choose [P]lay. The sign will play over and over. Press any key to stop it and you will be returned to the opening menu at the end of the current loop.

CREATE A SIGN

From the main menu, choose [R]ec to record the "script" for your message. You can also use [R]ec to add to an existing script. [L]oad and [P]lay the script you want to add to, then press any key to stop it. When the main menu appears you can then add on to the end of the script by pressing [R].

The [R]ec submenu has five choices: [W]rite, [S]croll, [P]ause, [O]ption, and [L]oad. All but the last lead to more submenus. Choose



[W]rite to actually put things on the screen. The four choices in this submenu are [E]nter, [P]lace, [C]lear, and [O]nscreen.

In [E]nter you can type in up to 119 characters (3 lines), followed by a [RETURN]. The string you enter will be kept in a temporary buffer which you can [P]lace on the screen one or more times. To cancel this operation, delete any unwanted text and press [RETURN].

[P]lace puts the string just entered somewhere on or just off the screen, as directed in the submenu. Position the text by moving the cursor with the joystick or arrow keys. If you selected the [O]nscreen option from the submenu, the string will begin at the spot you choose on the screen.

[C]lear leads to a submenu allowing you to clear a character, line, or the whole display.

In the [W]rite submenu, [O]nscreen lets you put single characters on the screen, in any position. The characters will appear one at a time, in the order entered, as the message plays.

You can move the cursor with the arrow keys or the joystick. [RETURN] will send the cursor to the beginning of the next row. The [DELETE] key will not work here. Space over what you want deleted and edit it out later, in the [E]dit menu. Special characters (those used for the movement keys) can be entered by pressing [ESC] first, then the key. Press [ESC] twice to exit.

[L]oad asks for a filename and records it on the script. When the program reaches this instruction while playing a script, it will load the new script into the buffer and play it. (If the file cannot be found, the instruction is ignored.)

With this command you can set up a chain of files to be played, and later easily cut and paste messages out of or into the chain. Editing long scripts can be excessively time-consuming, so it's a good idea to separate messages into different files to keep scripts short.

[S]croll moves a line or the whole screen horizontally or vertically. If you choose to scroll a line, use the joystick or arrow keys to position the cursor over a line, and press [RETURN] or the joystick button to select it. Next choose the distance to scroll with the joystick, arrow key or the [SPACEBAR]. Then choose a speed.

[P]ause records a pause on the script. The submenu offers sixteen lengths of pauses—[0] is about seven seconds, [15] is about 40. To save time, the pause won't play during [E]dit mode.

[O]ption leads to some nifty effects. The four choices are [S]hift, [C]olor, [B]link, and [M]isc.

[S]hift is a toggle between uppercase and lowercase for the screen display. Graphics 2 only allows uppercase, numbers and punctuation, or lowercase and graphics on the screen at one time.

[C]olor lets you set the colors and brightnesses of the background and the four color registers. (The four colors can be displayed by using uppercase and lowercase normal and inverse characters.) The pointer starts at the current value in the color and luminance menus. You can include many color changes on a script.

[B]link can select one of four groups of characters and make them blink at varying speeds. If characters

are already blinking, use [B]link a second time to stop them.

[M]isc leads to [F]ade, which fades a character color in or out, and four items which can lead to user-defined routines.

EDITING SCRIPTS

When you chose [E]dit from the main menu, each instruction in the script is played one at a time, then listed in the text window. After each step you can either [C]ontinue to the next instruction, [D]elete the last instruction, or [I]nsert more instructions after the last. The first instruction shown is BEGINNING. You can't delete this, but you can insert more instructions here, at the very start of your script.

After you [D]elete a step, you may either [C]ontinue or add changes at this point with [I]nsert. Because of memory restrictions, the effects of your deletion will not be shown on the screen—you have to play through the script again with [P]lay or [E]dit to see the effects.

[I]nsert leads to the [R]ecord submenu. Everything you record is inserted into the script after the last instruction played. Exit this mode by pressing [ESC] to back up into the [E]dit menu.

MAKING GRAPHICS

To add graphics to your messages, you will need to first go into the alternate character set that includes the control characters. From the main menu choose [R]ec. From the submenu choose [O]ption, then the [S]hift option. (Any text already on screen will be converted to the alternate character set.) Because of the limitations of Graphics 2, you can only use lowercase text with your graphics.

Press [ESC] to return to the previous menu, and choose [W]rite, then [O]nscreen. In onscreen writing, you can place characters one at a time where you want them on the screen. Using various combinations of keys, you can build graphics in four colors. Experiment to discover all the possible characters that result from using [ESC], [SHIFT], [CONTROL] or [INVERSE] with other keys.

Even if you space over a character, it will reappear briefly when you [P]lay the message. To clean up unwanted characters or make some changes, go into [E]dit from the main menu. Characters entered through onscreen writing will appear one at a time, giving you a chance to delete them. ▲

Andrew Thomas recently graduated from Indiana State University with a degree in technical journalism. His program Quizzer appeared in the October 1988 **Antic.**

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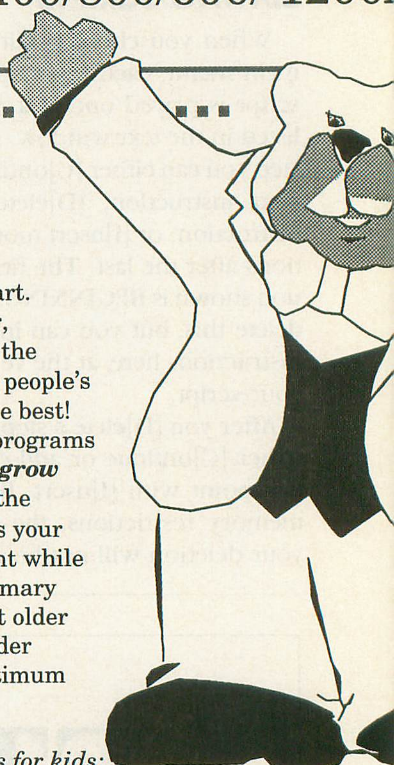
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Tech Tips

The following three Tech Tips come from Greg Vozzo of Brightwaters, New York.

M/L START-OVER

If you want to restart a machine language program, you must reboot the computer, right? Wrong! This short program lets you restart your machine language program just by pressing the [RESET] key. It will also run short machine language subroutines before entering BASIC. To disable the M/L Start-Over routine, either hold down [SELECT] after pressing [RESET] until the READY prompt appears, or POKE anything except a 1 into memory location 1791. Be SURE that your machine language routine doesn't use Page 6.

Don't type the TYPO II Codes!

```
AG 100 FOR I=1768 TO 1790:READ A:POKE I,A
    :NEXT I:FOR I=1536 TO 1560:READ A:POKE
     I,A:NEXT I:A=USR(1536)
ZJ 200 FOR I=1536 TO 1560:POKE I,0:NEXT I
    :? "ML AUTORUN PROGRAM INSTALLED.":? "
    PRESS RESET TO ACTIVATE.":NEW
DB 500 DATA 32,252,6,173,255,6,201,1,208,
    10,173,31,208,201,5,240,3,108,253,6,96
    ,LOW,HIGH
IX 600 DATA 104,169,1,141,255,6,165,12,14
    1,233,6,165,13,141,234,6,169,232,133,1
    2,169,6,133,13,96
```

TEXT CENTRAL

This routine shows you how to center your text on a Graphics 0 screen. In lines 65-66, if the cursor is already in the correct row, then instead of using POSITION X,Y, you can use POKE 85,X to set the X position. The last REM statements describe how to enter several lines of text vertically. These can be combined with horizontal centering.

Don't type the TYPO II Codes!

```
LX 5 REM TO CENTER TEXT HORIZONTALLY
TL 10 GRAPHICS 0:REM USE ANY MODE
CA 15 POKE 752,1:REM DISABLE CURSOR
TS 20 COL=40:REM # OF VERTICAL COLUMNS
SR 30 Y=11:REM Y COORDINATE
TK 40 DIM TEXT$(14):TEXT$="ANTIC MAGAZINE
    ":REM TEXT TO CENTER
YO 50 X=INT((COL-LEN(TEXT$))/2):REM FIND
     STARTING X COORDINATE
SX 60 POSITION X,Y:? TEXT$:REM PRINT
JG 65 REM OR... POKE 85,X IF CURSOR IS
IG 66 REM ALREADY AT THE Y COORDINATE
TQ 70 GOTO 70
XL 100 REM TO CENTER VERTICALLY,
GZ 110 REM USE THIS FORMULA:
WL 120 REM Y=INT((R-ROWS)/2)
QC 130 REM Y=Y COORDINATE OF FIRST TEXT
     LINE.
RJ 140 REM R=NUMBER OF HORIZONTAL ROWS IN
     SELECTED GRAPHICS MODE.
IM 150 REM ROWS=NUMBER OF ROWS USED BY
     TEXT.
```

TUNING VIDEO COLORS

Having a tough time tuning your Atari's 16 colors correctly? This short program draws the 16 colors in horizontal bands, in ascending order from 0 to 15.

*10 GRAPHICS 11:FOR I=1 TO 15:COLOR I:FOR J=I*10 TO I*10+8:PLOT 0, J:DRAWTO 79, J: NEXT J:NEXT I 20 GOTO 20*

Refer to the following Color Table as you adjust the color and tint controls on your monitor or television set.

HUE #	*COLOR*
0	*Gray*
1	*Gold*
2	*Orange*
3	*Red-orange*
4	*Pink*
5	*Pink-purple*
6	*Purple-blue*
7	*Blue*
8	*Blue*
9	*Light blue*
10	*Turquoise*
11	*Green-blue*
12	*Green*
13	*Yellow-green*
14	*Orange-green*
15	*Light orange*

This Color Band program requires that your Atari have a GTIA chip, which was not in some of the older pre-XL Atari units. To test your computer, type **POKE 623,64**—*and if the screen turns black, you have GTIA. A blue screen means you don't.*

Antic pays $25 for every original and exclusive Tech Tip submission that we publish. Send your 8-bit or ST disk and printout to: Antic Tech Tips, 544 Second Street, San Francisco, CA 94107. Tech Tips welcomes very short programs that demonstrate the Atari's powers, simple hardware modifications, or useful macros for popular software.

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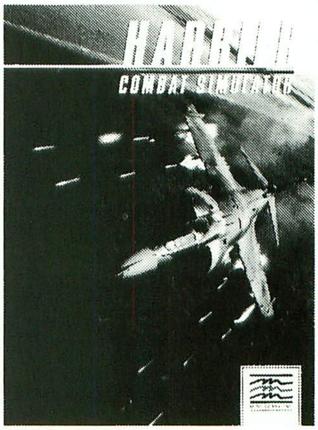
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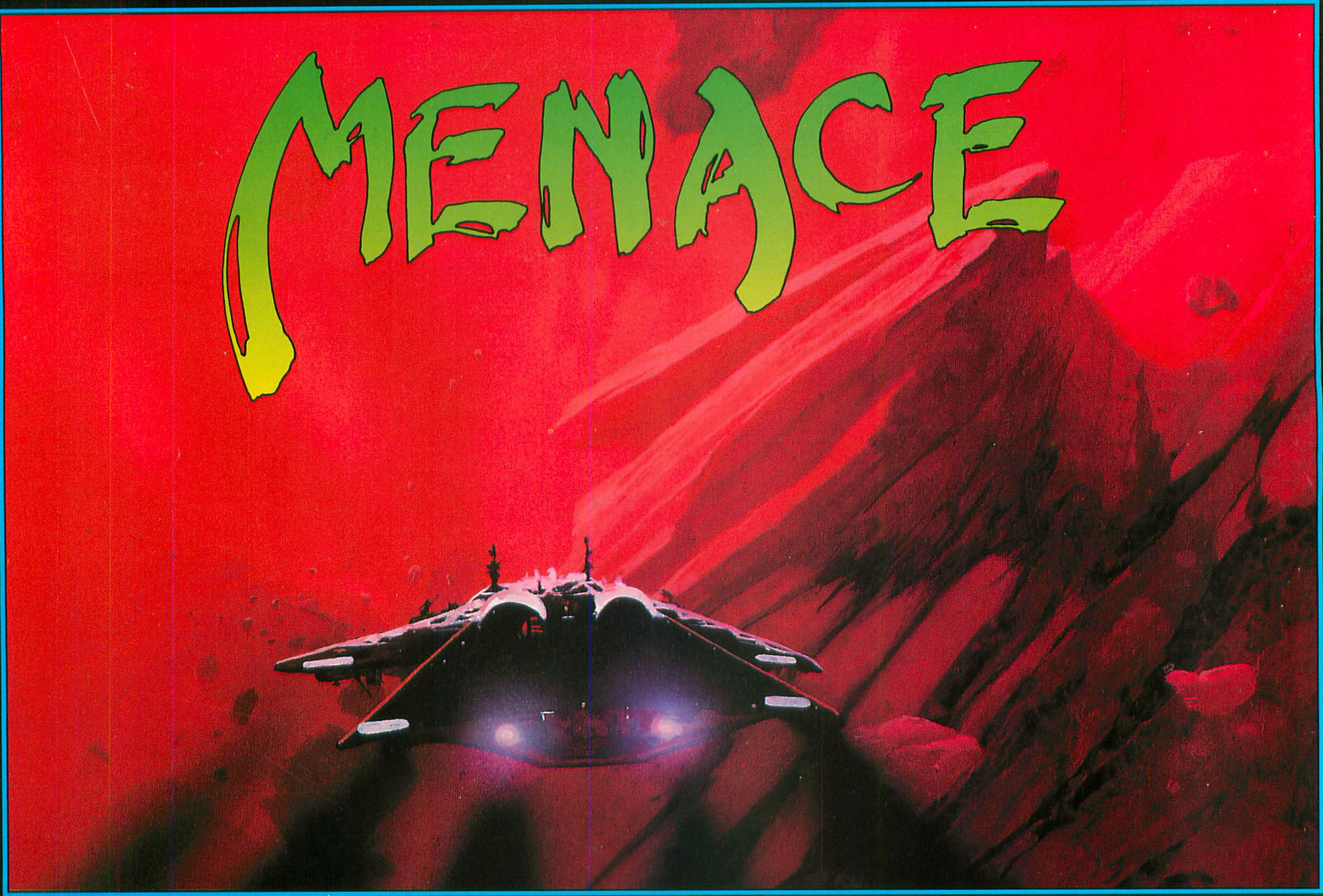


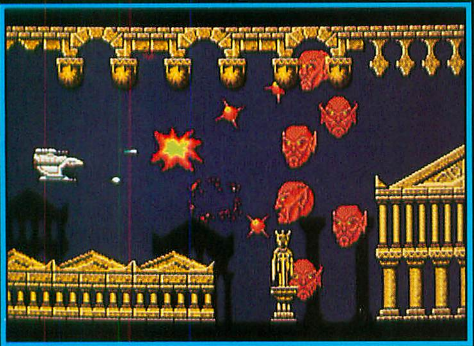
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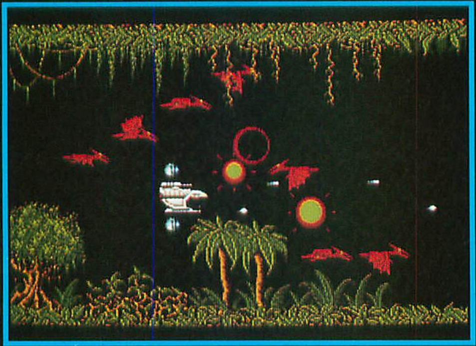
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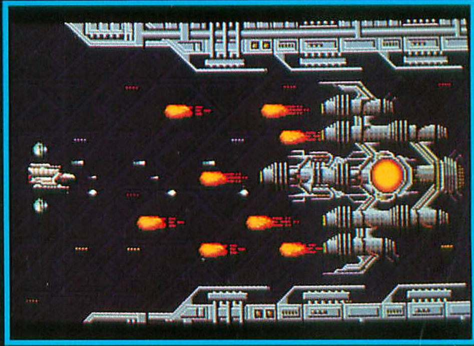
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Your mission orders are simple, you must destroy the planet Draconia. In theory possible, in practice . . .

The planet Draconia, an unnatural planet, has been formed over many centuries by six of the most feared rulers that have ever existed. These rulers, exiled from their home galaxy, have ravaged and plundered space, using the worlds they have destroyed and the life forms they have created to build this planet of fear and death.

Now an end must be put to their reign of terror. A large scale attack will prove too costly to our space fleets. Draconia has many orbiting defence systems, the sacrifice may be in thousands of lives. A single fighter craft, approaching undetected, may have a chance to avenge those who have perished, by destroying Draconia. You have that chance . . .

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